Making sense of Information Systems failures

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Abstract

Information systems (IS) are used almost everywhere around us and we cannot even conceive of a world without computerised systems. IS support essential functions in most areas and levels of society. These include education, business, leisure, and medical and scientific areas. Moreover, IS add to the competitiveness of companies and support the continuous change that takes place in business and its environment. Literature frequently reports on Information systems that fail or are abandoned in many domains and in many countries. Often IS are seen by users as underperforming, failing to meet expectations and not delivering value to customers. In order to reduce IS failures numerous studies have been conducted resulting in solutions being offered to improve the situation. Post-project reviews are often used to learn from mistakes.

Social sciences regularly use narrative analysis methods to analyse stories to understand the experiences of people in settings such as psychology and education. This study borrows from the social sciences and proposes the use of narrative analysis in investigating IS failure research.

A case history was identified in which IS stakeholders were asked to share their experiences regarding the development and use of the IS. Three narrative analysis approaches were applied in this study to analyse the accounts of the stakeholders taking into account the perspectives of multiple user groups. This was done in order to study the thesis statement: *narrative analysis methods can be useful to make sense of Information systems' failures.* A multi-perspective framework for analysing IS stakeholders' accounts was constructed, during the study, which could be used by developers to gain insight from the users of previous systems in order to learn from mistakes for subsequent systems. It is shown in this qualitative study, where narrative approaches were followed to gather, analyse and interpret the rich, multi-voiced and incoherent stories of IS stakeholders, that each approach helps to make sense from the accounts of stakeholders in different ways and highlight important elements.

It is shown that narrative analysis methods that were used in this study can produce deeper insights into the experience of involved stakeholders. The insights obtained from applying narrative methods can be used for internal learning within organisations as well as externally within the discipline. It is shown in this study that all voices must be heard; the small stories of stakeholders should also be taken into account when listening to users. Reading between the lines reveals information that cannot be ignored if IS are to be developed to the satisfaction of all stakeholders. Indeed, systems become alive and take on a character of their own when the accounts are analysed on a deeper level and systems can therefore be designed in new ways that enable developers to address a wider set of constraints representing multiple groups of stakeholders.

The contribution of this work is on more than one level. Information systems development practice can be influenced and enriched by gaining deeper insights that address the concerns of the diverse groups of stakeholders. The research methodology field of IS has also been impacted upon by the successful importing of methods from another domain and has thereby also given back to the discipline it has borrowed from. Narrative practice and theory can make use of the new insights gained in a new area of application, namely IS failures. The conclusion of this study is that narrative approaches and storytelling can be useful and applicable when investigating IS failures and improves the understanding of IS development and users' concerns taking into account multiple perspectives of stakeholders.

Acknowledgements

I express my sincerest gratitude to:

- My Heavenly Father: This research journey – from start to end - was made possible through Your power, love and grace alone.
- My family: Günther – my husband and best friend. Thanks for being there for me and believing in me. You listened numerous times to my stories. My children; Richard, Riëtte and William - I am blessed to be your mother. Thanks for having patience with me so many times when I was working. I am proud of you and I will always love you.
- My supervisory team: Darren Dalcher and Penny Duquenoy. I appreciate your guidance and support throughout this journey.
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- All participants in this study: Thank you for sharing your stories with me.
- For the two examiners: Elke Duncker and Peter Elsmore – I appreciate your time and valuable feedback.

Dedications

I dedicate this thesis to our son - Richard, and my family, that stood together in difficult times:

Every PhD journey has a unique narrative. We lost two very near loved ones during my study time. Our eldest son Richard (23) passed away during my sabbatical which I wanted to use for completion of this study. This tragedy took our family on another course of life.

Richard, your story is still unfinished – until we meet again…

Twenty months later my mother was buried next to her grandson - our son and brother. Thanks Mom for giving life to me on this earth. My dad's support and love for her – especially the last eighteen years of dedicated help after her stroke is an example to all of us.

Life without love is impossible.

I thank everyone who is part of our journey and helping us to continue amid sad and tough times.

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Chapter 1 The research problem

1.1 Introduction

This chapter introduces the context of this research. Information systems (IS) have a long track record of failures and a need exists to investigate this phenomenon. This chapter defines the background of the problem. The fields of study that were used in this research are highlighted. The problem is stated followed by the limitations that were considered. The research aim and objectives that guided this research are given. The structure of the thesis is outlined and finally important terminology for this work is introduced.

1.2 Background

Information systems play an important role in business. Their use creates opportunities for companies to be competitive, they enable organisations to incorporate change and they support business activities and processes (Avison & Fitzgerald, 2006). However, some of the systems that should support these changing environments often fail. These failures could be during different stages of the system's lifecycle e.g. development, operation or even a technology failure. Large amounts of money are wasted on information systems (IS) that fail or malfunction. Indeed, not only do financial losses occur but often other side-effects are experienced such as negative publicity, damage to the image of individuals or companies or lives that are threatened. IS failures, or broader even, any kind of projects that fail, are regularly reported on and receive attention in the media. Reports and other publications have been published on a regular basis with statistics on IS failures. They also provide lists of factors that contribute to failures (see for example, Eveleens & Verhoef, 2010; KPMG, 2005; Standish: 1999, 2001, 2003, 2004, 2009).

Reliance on IS and technology to support business functions has grown over the years, yet some systems still fail. The following cases provide examples of information systems that have experienced certain problems or have been perceived as failures (Codd, 2011; Computerworld, 2000; Engelbrecht, 2007; Fortune & Peters, 2005; SFC, 2009):

- *'Confirm' reservation system: USA, abandoned 1992,*
- *London Ambulance service system: UK, 1992,*
- *Greyhound Lines Inc. – Trips reservation and bus-dispatch system: USA, 1993,*
- *Melbourne Ambulance dispatch system: Australia, 1995,*
- *FoxMeyer Corp. – ERP system: USA, 1996,*
- *Eli Lilly vs. Federal Trade Commission: USA, 2001,*
- *Mizuho bank – online system: Japan, 2002,*
- *Integrated Justice project: Canada, 1997-2002,*
- *eNATIS (Electronic National Traffic Information System): South Africa, 2007.*
- *'22 people wrongly arrested in Australia due to failures in new NZ $54.5 million courts computer system', 2011.*

The systems above are from different continents encompassing both the public and private sectors. Common features to all the examples were high budgets and complex natures. They were all supposed to improve the situation in which they were to operate as well as support users in their business functions. However, they were all mentioned in the media and labelled

by some of the stakeholders as IS failures, disasters, challenged systems, runaways, death march[1] projects or development failures. Such labels were awarded as a result of one or more of the following (Ewusi-Mensah, 2003; Glass, 1998; Standish, 2001; Yourdon, 2004):

- Time and/or budget constraints that were not met.
- Expectations and requirements of stakeholders that were not adhered to in terms of usefulness or usability.
- Lower quality than expected.

The above list, although not exhaustive, demonstrates the mix of reasons why some IS are experienced as failures and shows the way we judge failure. Failure is defined in ways that includes monetary, time as well as functional factors.

For the purpose of this research an IS failure is seen as an information system experiencing problems in any of the above areas, whether during development or during operation. There could thus be failure situations at certain times in a fully operational IS when user expectations are not met. Figure 1.1 has been constructed by the researcher to indicate that failure situations could be experienced by stakeholders at different stages of the lifespan of an IS.

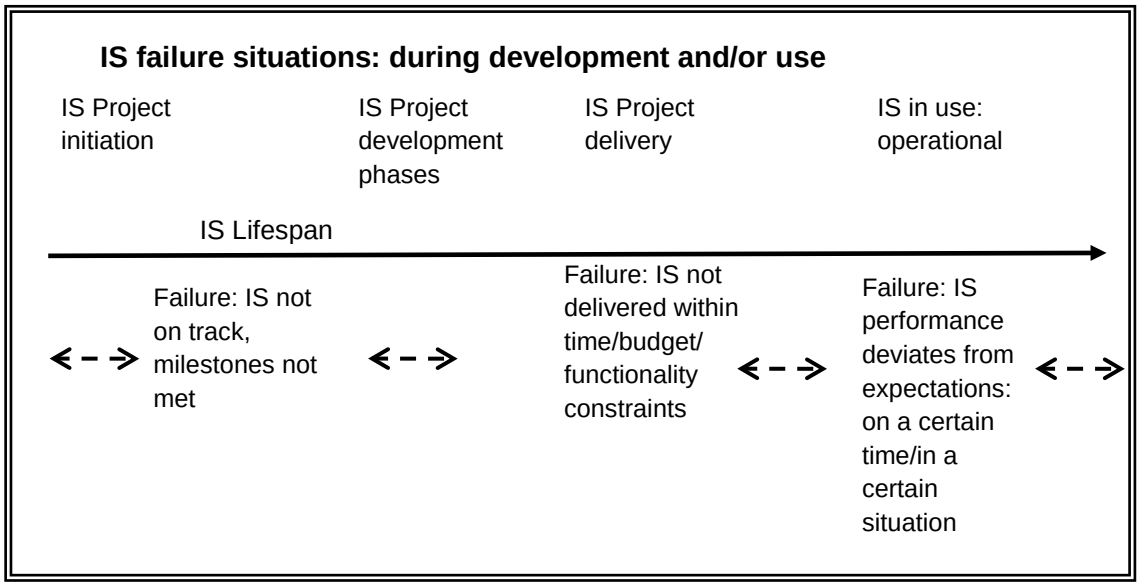

Figure 1.1 Examples of failure situations in the lifespan of information systems (own construction)

At the initial phases of an IS; failure could for example be experienced in that certain milestones are not met or during the developing phases that the users are not happy with the progress or they feel excluded. Even when an IS is in use the perception of failure can be evident in that the performance of the system does not live up to expectations or operational errors occur at times.

[1] Death march refers to the status of a project: if the parameters (e.g. staffing, schedule, budget) exceed the norm by at least 50% (Glass, 1998).

The implication of failure is enormous. Companies and individuals may experience financial or image damage due to repeated IS failures (Fortune & Peters, 2005). Even though there are methods and approaches that aim to improve the situation, it still seems that there is a lack of learning from previous mistakes. Fortune and Peters (Ibid.) summarise specific approaches to investigate failure. These include project management approaches, interaction approaches, interpretive approaches, context specific approaches and general failure approaches that are relevant to IS failures.

As seen Fortune and Peters (Ibid.), the literature reports quite a few approaches to understand and make sense of IS failure. However, the continued reporting of failures in the IS domain indicates the problem is far from resolved (Codd, 2011; Codd, 2012; Williams, 2007). It is therefore deduced by the researcher that new and innovative approaches are required to apply in the IS field. A recent example of literature that confirms the need for research in this area of IS failure and success is Dwivedi *et al*. (2013) in the conference proceedings "Grand successes and Failures in IT". In the call for papers for this conference the aim was stated as "*to help advance our understanding of the success and failure of technology-based innovation"*. The central theme was *"the continuing difficulty of bringing IS projects to successful fruition"*. They ask the question whether the number one problem is theory and inadequate understanding, or may knowledge transfer be overlooked, or is there a failure to incorporate research knowledge in working practices of relevant stakeholders. They called on other sectors than that of commercial enterprises such as non-profits sectors as well to take part in this debate. This demonstrates the challenges that other sectors may be experiencing. It was also suggested to focus on extending the variety of research methodologies in this area using alternative standpoints (Dwivedi *et al*., 2013).

This research focuses on making sense of dynamic situations with multiple groups of stakeholders. It contributes to the methodology and approaches used in the investigation of IS developments by introducing new and innovative approaches to understand IS, including failures and the multiple perceptions of involved stakeholders. The theme of this study is the importation of narrative methods from other subject areas (e.g. social sciences or humanities), as an alternative or complementary approach to be used in understanding IS development and use. In particular, the ways that stakeholders tell stories and discuss their experiences of IS failure situations are investigated as they give an insight into the complex, multi-voiced scenarios that unfold. These stories as reflected by the stakeholders are referred to as narratives. Stories told by stakeholders are subjective, but are constructed around a core set of facts as remembered by the individuals (Lieblich *et al*., 1998).

1.3 Fields of study

This work is interdisciplinary of nature and the main fields that are investigated are information systems (specifically, information systems failure) as well as narrative theory stemming from the social sciences. This thesis will show how the overlapping occurs and why it was necessary to study both fields (See sections 2.2.10, 2.3.3 and 2.3.6).

1.4 Problem statement

As mentioned in the background section the prevalence of information systems (IS) failure is still high and although numerous studies have been conducted to improve the situation many

problems and dissatisfaction with software products still exist. Chapter 2 will present a background study on IS failures and describe ways that have been used, or proposed, to try and understand the problem. It will be shown that formal post-project evaluations are not adequate for learning from past experiences. Statistics seldom give insight into the intricacies that exist in the development environment and experiences of the different stakeholders. Very few review approaches attempt to include the multiple perceptions of all the different stakeholders or actors. Everyone involved in the IS – also the marginalised - may have important contributions to make.

The problem that this study will address is as follows:

> *Most current post project evaluations attempting to make sense of IS failures do not take into account all the stakeholders' experiences in order to understand the IS failure phenomenon*.

The claim of this research stemming from the problem statement and background discussion is therefore:

> *Narrative analysis methods can be useful to make sense of IS failures.*

1.5 Limitations of this study

The study explores a new and potentially fertile area for research which has developed over time. It is a new attempt to make sense of IS failures by importing a different approach into IS to address the issues discussed above. There are limitations to this type of study as the work will not, and cannot, attempt to include discussion of the details of all possible narrative analysis approaches. Moreover, there is such a variety of ways to conduct narrative analysis; there is not a prescription of which method can be applied to each unique phenomenon. Factors such as the research questions and the study environment, as well as the constraints of what is feasible during a research project will determine the choice of methods. There will be no attempt to classify or categorize the ways narrative analyses can be done. Other researchers have tried categorisation of methods, however they confirmed that there is little value in it as this does not contribute to understand the phenomenon under investigation (Lieblich *et al*., 1998; Clandinin & Connelly, 2000). Instead, three different broad approaches of narrative analysis will be described and applied in this study in order to address the research objectives that are listed in the next section. Further limitations that were realised during the study will be elaborated upon in the final chapter (section 8.3).

1.6 Research aims and questions and objectives.

The aim of this research is to import research methods from the social sciences and apply narrative analysis approaches to the stories of information systems stakeholders in order to make sense from their experiences and understand more about IS failures. The usefulness of three different broad narrative approaches will be assessed and described.

The research question is defined as follows:

> ***How can narrative analysis methods be useful to make sense of IS users' experiences in information systems failures?***

The objectives of the research are:

- *To present the current status of IS failures by providing background on the phenomena.*
- *To present current approaches for investigating IS failures.*
- *To provide a clearer understanding of narrative approaches that could be used for investigating experiences of IS users and their perspectives.*
- *To apply narrative approaches to a specific IS and uncover the stories of the different user groups regarding their experiences of the system.*
- *To assess the usefulness of narrative approaches in the IS failure field and propose alternative ways to make sense of IS failures.*

1.7 Significance of the research

This qualitative research makes a contribution to knowledge in several ways and in more than one field. As this study is interdisciplinary by nature the IS field as well as the narrative theory discipline are brought together to address a gap in useful methods for studying IS failures. This research focuses on the methodological level and contributes to the methods of understanding IS failures; bringing the narrative family of investigative approaches into the armoury of the IS discipline. It will be shown how narrative analysis methods from the social sciences can be useful to make sense of IS failures, taking into account different viewpoints of stakeholders, unlocking possibilities to learn from mistakes. This work also adds to the body of knowledge in the narrative theory discipline. It is shown in chapters 7 and 8 how the IS and narrative fields are impacted upon in theory and practice.

1.8 Thesis layout

Chapter 1 introduces the research problem and objectives and gives the layout for the thesis.

Chapter 2 gives the background on the two main fields of study, viz. IS failures and narrative approaches. It is shown that the current ways of investigating IS failure and problems are not adequate and other ideas and methods are necessary to address these problems. Narrative methods are discussed and three broad approaches are presented to be used in this study.

Chapter 3 sets out the research methodologies used in IS in general and also explains the specific way this research is undertaken. The research design is presented in this chapter.

The following three chapters then describe the application of the three narrative approaches:

Chapter 4 uses retrospective sense making, chapter 5 presents the application of living story as the narrative approach while chapter 6 applies an antenarrative approach.

Chapter 7 brings the three approaches together where their usefulness and applicability are evaluated and compared.

Chapter 8 summarises the study and concludes the importance of borrowing methods from other disciplines thereby putting on other lenses to make sense in the IS failure field. Proposals for further work are presented from the insights gained from this study.

A graphical overview of the thesis structure is as follows:

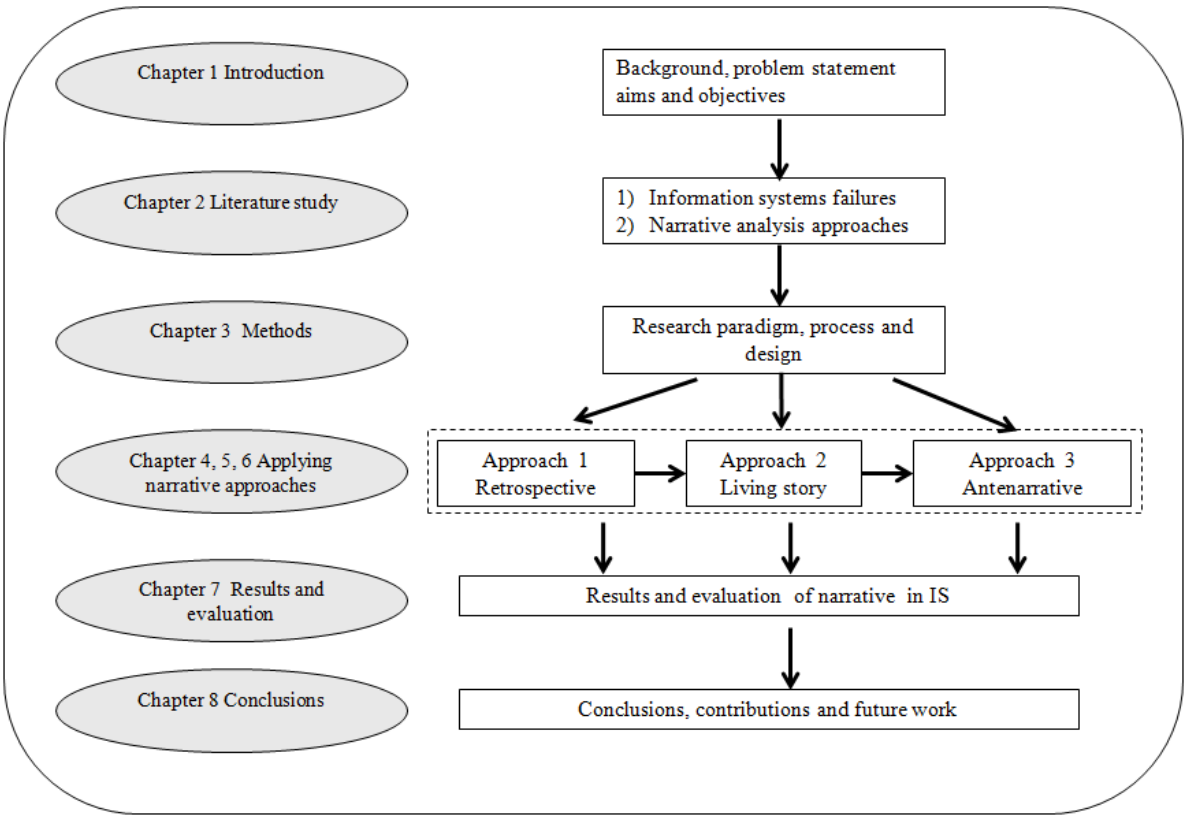

Figure 1.2 Structure of the thesis

1.9 Terminology used

In order to clarify terms that are used thorough the document the following descriptions or definitions are given:

- Information systems (IS)

  IS can be seen as a collection of people, data, processes, interfaces and networks that are integrated for the purposes of supporting and improving the day-to-day functions and processes in a business as well as providing problem-solving and decision-making information for management (Bentley & Whitten, 2007). There are many subclasses of IS such as management information systems (MIS), decision support systems (DSS), etc.

- Information technology (IT)

  IT refers to the combination of software, hardware, products and services that people use to share, manage, access and communicate information (Shelly *et al*., 2006:4).

- Projects

  In the light of this specific study the term project will refer to an information system, software or IT project. A project can be defined as a sequence of complex activities

having a single purpose and the project must be completed within the time, budget and specification constraints. A formal definition given by PMI Guide to the Project Management Body of Knowledge (PMBOK Guide) is: *"a project is a temporary endeavour undertaken to create a unique product or service" (PMBOK, 2004).*

- IS failure

  IS failures can generally be defined as IS projects that have gone over their budget, could not be completed in the planned time or where the functionally and usability were not as expected by the stakeholders. For example, the MasterNet trust accounting system of the Bank of America had losses of $78 million and is known within the IS industry as a system that had fallen short of expectations (Glass, 1998). The New Zealand Education department's centralised payroll system had to be implemented in 1989 but was scrapped by government. The system was labelled as "*a disaster for everyone to see*". Problems such as delays and errors resulted in incorrect payments or no payments at all to teachers at month-end (Myers, 1994). However, some of these systems are finally being used – after changes and improvements have taken place. It could be that some of the stakeholders are satisfied with the system while others are not. It could be that some aspects of the system are accepted by some users and other aspects not. A clear-cut definition can therefore not easily be formulated.

  Fortune and Peters (2005) support this view of difficulty in defining IS failure. Often a system is judged against performance criteria, which can differ for different stakeholders. Bignell and Fortune (1984) are of the opinion that it is matter of judgement whether a particular case is deemed to be a success or failure. They emphasise that comparison should be used in judgement to assess the output from an activity against an ideal or goal. Failure occurs when the comparison shows a shortfall. This shortfall can be a deviation from a set of standards. The comparison can also take place over time and then the performance may occasionally fall below a standard and result in a brief shortfall that needs to be investigated. Again, Figure 1.1 has shown these failure situations in the lifespan of an IS.

  For this research the view is that an IS failure can include any of the above-mentioned situations. Such a wide description is given because for the purpose of this study we are interested in the narratives of stakeholders regarding their own experiences where there has been a disagreement or where there is a mismatch of opinions. What is necessary here is to get different stakeholders to tell their stories and to share their experiences, whether the information system was delivered late, not usable, over budget, not functioning according to requirements or deviated from expectations at certain times.

- Narratives

  Lieblich *et al*. (1998:7) state that humans are storytellers by nature and that through stories researchers can explore and understand the inner world of individuals. Narratives provide the researcher with access to people's identity and personality. In

the IS failure context, narrative inquiry is used to retrospectively untangle a web of actions and events as well as to gain insight into the experiences of stakeholders.

Narrative analysis has to do with interpreting things. Narratives link to past actions but also show how individuals understand those actions and experience. The narrative approach advocates pluralism, relativism and subjectivity (Lieblich *et al*., 1998). Narrative research refers to any study that uses narrative materials. The data that are collected in this study is of such a nature, e.g. stories from failure situations from the perspective and context of the different stakeholders.

- Case studies

  Case studies are used in a wide range of evidence collection and analysis procedures. A widely-cited definition states the scope of a case study (Yin, 2003:13):

  A case study is an empirical inquiry that:

  - Investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

  Case studies in the failure context provide a mechanism for an in-depth exploration of the multiple subjective accounts of the stakeholders.

- Case histories

  Dalcher (2004) recommends the use of the term *case history* rather than case study when failures are investigated. The investigation of a failure incident takes place after the event and the case history is therefore concerned with providing background and context information to establish deeper meaning and thereby gain a new understanding.

- Stakeholders or actors

  All the people involved in or impacted by a project are referred to as actors or stakeholders. The actors therefore include the developers, users, sponsors and other role-players. In this research the terms respondents, interviewees, participants and actors will all refer to the stakeholders when interviews are conducted or findings are discussed.

- Sensemaking

  Weick (1995) concentrated on sensemaking in organisations and stated that the concept of sensemaking means literary making of sense. These terms will be discussed further in section 2.2.10.1.

1.10 Summary

This chapter has set the context for the rest of the research story that is presented in the following chapters. This may not be seen as a 'traditional' IS thesis, however in order to get to other destinations and to find improved solutions and perspective, the journey may differ from

other routes and maps and lead to new discoveries and insights. The next chapter presents the literature review that reveals the necessity for this study on information systems failures and narrative analysis.

Chapter 2 Literature review

2.1 Introduction

This chapter provides background to the numerous studies, discussions and research from the two main study fields for this thesis, viz. information system (IS) failures and narratives. The aim of this chapter is to give insight to the background of the themes and how it inspired this work. Both themes are discussed under subheadings indicating the main topics that influenced the research process for this study.

2.2 Information systems failures

2.2.1 Introduction to IS failures

A literature overview of one of the central themes of this research, namely information systems failures, is presented in this section. It is not the intent of this discussion to give a comprehensive categorization of factors that contribute to the failure and success of systems, but rather to give an insight into the plethora of existing research and reports on this phenomenon. Different definitions of IS failures, the history of failures and the first use of the term are presented in this chapter. Remedies proposed in the literature are discussed. Furthermore, the relationship between success and failure is presented. The question of 'why do we still fail' is discussed and then possible ways of investigating failures are addressed. The connection with narratives is also presented to indicate why these two disciplines came together. Thereafter the other theme central to this study - narratives – is presented in section 2.3.

2.2.2 IS failures: an overview

The computing discipline regularly experiences and sees information system development failures. Huge financial losses are annually suffered due to failed IS projects (Codd, 2011; Kualitatem, 2012; Oz, 1994; Royal Academy of Engineering, 2004). Indeed, in 1995 alone the estimate was that $81 billion would be wasted on cancelled or failed projects in the USA (Standish, 1995). The media very often reports the grim stories of failed IS projects: projects that do not meet the time or budget constraints, or do not deliver the expected functionality. This is echoed by many authors and researchers (Berinato, 2001; Codd, 2012; Keil *et al.*, 1998; May, 1998; Montealegre & Keil, 2000; Mosquera, 2005; Standish, 2001, 2003; Walton, 2004). Losses are very often quoted in monetary values. A good example of this is the CONFIRM project that aimed at developing a comprehensive travel industry IS which resulted in a $125 million disaster (Oz, 1994). Another example is from the supermarket group Sainsbury's that wrote off a £290 million IT investment in a supply chain system (McCue, 2004). However, not only do financial losses occur but very often other resources are affected. The worst case could be human lives that are endangered by dysfunctional IS. A number of casualties were attributed to a failed system in the well-publicized London Ambulance Service System (Goulielmos, 2005).

Not only are huge amounts of resources wasted by organisations, but the stakeholders involved may experience frustration and anguish when IS projects do not live up to expectations or fail. Companies may face legal actions, the internal climate of the companies

involved may deteriorate, key staff could be lost, people, or indeed the companies involved could lose their good reputation and negative publicity could harm software development houses or individuals. This list of negative consequences when experiencing IS failure is by no means comprehensive, but serves as a motivation for the continued investigation of IS failures.

The failure phenomenon has been researched for many years resulting in the identification of numerous factors contributing to failures. Many different proposals for improving the situation have been presented in literature and courses, and conferences to address the phenomena have been held (Ewusi-Mensah, 2003; Fortune & Peters, 2005[2]; Kanter & Walsh, 2004; Yardley, 2002). Brock *et al*. (2003) and Eveleens and Verhoef (2010) summarize the Standish Group's findings in their 'Chaos' reports on successes, failures and challenges over a number of years.

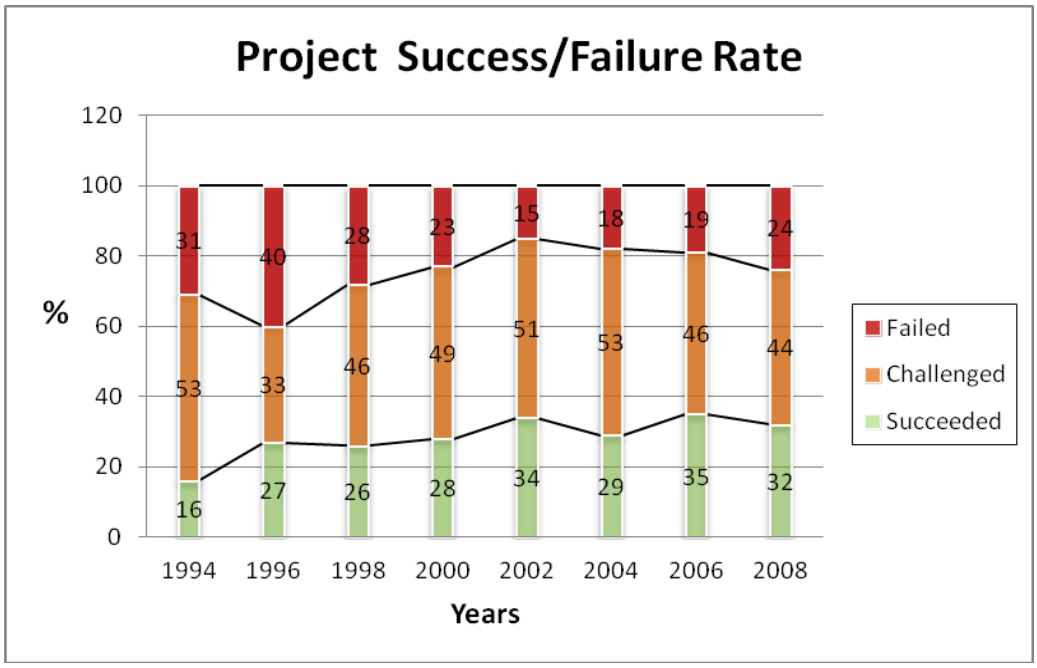

Figure 2.1 Project failures, successes and challenges (Brock et al., 2003; Standish, 2004, 2009, Eveleens & Verhoef, 2010)

The number of information technology (IT) projects undertaken has increased significantly over the years and the cost overruns were reduced from 189% to 45% between 1994 and 2000. The percentage of failures however, has not decreased significantly. In 1994 it was 31% and has decreased to 18% in 2004, thereafter a slight increase again (Standish, 2004, 2009; Eveleens & Verhoef, 2010). There are, on the other hand, researchers that challenge these figures (Glass, 2006; Jørgensen & Moløkken-Østvold, 2006) and questions have been asked about the possible bias of the Standish surveys. However, the majority of literature sources on IS failure support the trends in the Standish reports and affirm the need for solutions to be found to avoid IS failures. In this context an example of how difficult it is to manage software projects within time, cost and functionality requirements is found in a report by Tiwana and

[2] Some proposals for improving the IS failure situation are according to Fortune and Peters (200%); the systems failures approach, project management approaches e.g. critical success factors, etc.

Keil (2004) who surveyed 60 companies, including 720 project assessments by senior IT managers, to come up with risk drivers which they called 'seeds of project failures'. Many more articles echo this type of investigation suggesting various routes that can be followed in order to avoid failure (Bupa, 2005; Goulielmos, 2005; Taylor, 2006; Van Huy & Chae, 2004).

In the next section definitions of IS failures as they appear in the literature will be discussed.

2.2.3 Definition of IS failures

Failures are defined and described in many different ways. Indeed, from the literature we can see that the concept 'failure' is referred to in numerous different terms. For the purposes of this study the term IS failure will mostly be used although some of the descriptions in the literature refer to the term project failure. The term IS may refer to the product, and the project (management) notion may refer to the process that was followed to develop the IS. The literature very often use the terms software, system, project, IS or development effort interchangeably when referring to failures as indicated in Chapter 1. Hence the term 'failure' will be used in this context to refer to any IS that experiences problems as indicated in Chapter 1. In this study we are interested in the verbal accounts (stories) of stakeholders after failures have occurred – be it during development or after the system is put in use. This is necessary to understand their experiences - as set out in section 1.4.

It is difficult to define the term IS failure and a complicating factor is given in the 2005 KPMG Global IT project management survey report as follows: The achievement of promised benefits is now added to the list of traditional reasons for failure and success. The words of two respondents of the KPMG survey are given below to accentuate this situation (KPMG, 2005:21):

- *"Project failure – we don't have a definition."*
- *"A project is a failure if it has not fulfilled its objectives of improving the decision-making capabilities of the management team. Projects may overrun in terms of cost and schedule, but these can be overshadowed if the desired impact on business improvement is achieved."*

There are numerous references to failure linked to software, systems or software projects. The following table presents more of the definitions (DE) and classifications (C) and discussions (D) found in the literature.

Author/study	**DE C D**	**Description**
Glass (1998)	**DE**	"*a project that goes out of control primarily because of the difficulty of building the software needed by the systems*" (Glass, 1998:3). The 'out of control' feature implies that it was no longer possible to manage the project in order to meet the original target goals. These goals could be cost, time, quality or functional requirements.
(KPMG as reported in Glass, 1998.)	**DE**	*"A runaway project is one which has failed significantly to achieve its objectives and/or has exceeded its original budget by at least 30 percent."*

Ewusi-Mensah (2003)	**C**	1. The inability of the implemented software to satisfy the users' expectation of performance. 2. The inability of software developers to produce a working system for the users – the development failure. The failure may be in not reaching the original cost or schedule estimates or the inability to achieve functional objectives.
Smith (2001)	**D**	Troubled projects, implying that they can still be saved from failure if the causes of the problems are corrected. All failed projects were once troubled projects.
The Standish Group (1999)	**C**	1. Successful: where the project is completed within the time and cost estimations and the functionality is as originally specified. 2. Challenged: This means the project is completed and is in operation, but the budget and time estimations are exceeded and fewer features and functions are present than specified. 3. Failed: The project is cancelled before completion.
Evans *et al*. (2002)	**D**	Dysfunctional software. Dysfunctional is defined by the Compact Oxford English Dictionary (2002) as 'not operating normally or properly'. This implies abnormal operation. In psychology abnormal behaviour is considered to be behaviour that is statistically rare as well as undesirable.
Glass (1998:10)	**C**	1. Crunch mode (as introduced by Boddie in 1987): this is a project that has a tight schedule with a lot of pressure being placed on the participants. 2. Death march (as introduced by Yourdon in 1997): this project has a nearly impossible schedule. The possibility of potential failure is high. 3. Runaway: A project close to or past its termination, the project fails to stay within its boundaries.
Kanellis & Paul (1996)	**D**	Misfit failure means the inability to meet the information needs of an organisation that operates in a dynamic mode. An information system is judged against dynamic and not static goals and therefore we should find better ways of thinking about change.
Lyytinen & Hirschheim (1987)	**C**	1. Correspondence failure: the design objectives as stated before the project started have not been met. 2. Process failure: the project results in a system, which involves a vast overspending of cost and / or time, or the process cannot produce a workable system. 3. Interaction failure: when the users do not use a system intensively and the interaction is low, it can indicate a failure. 4. Expectation failure: This is the inability of a system to meet stakeholders' expectations – which can be that requirements are not met. Disappointment occurs when beliefs or desires concerning how the system will serve a group's interest are not fulfilled.

Table 2.1 Definitions (DE), classifications (C) and discussions (D) of failures (own construction from sources indicated)

According to Lyytinen and Hirschheim (1987) the literature on IS failure lack detailed treatment of the failure notion. They further assert that we do not know exactly what is meant by the terms 'failure' and 'success'. This view is echoed in other related but more recent

research efforts as well, indicating an ongoing issue that needs to be resolved or clarified (Dwivedi *et al*., 2013; Fortune & Peters, 2005; KPMG, 2005; Young, 2005).

Few IS projects end up exactly as planned during the initial project management activities, such as financial budgeting, time estimations, quality requirements etc. For improved estimations, project management techniques are used, yet, despite these sophisticated methods, more than 80% of new systems fail to meet the goals for budgets, staffing, functionality and timelines resulting in IT managers assessing such projects as failures (Executive Government, 2005).

Numerous reports and articles discussing IS failures use the term failure without defining the term formally and offer lists of factors contributing to failures. In some cases little mention is made of what failure entails or what the authors understand by the term (Berinato, 2001; Jeffcott, 2006; Keil *et al*., 1998; May, 1998). It is expected that the reader already knows what is meant by failure which is however not a given in the light of the different views.

When evaluating the available literature on IS failure it can be seen that several authors describe failures differently. Indeed, different terms are used for projects that do not meet requirements or estimations in one way or another. Stakeholders can view the outcome of IS differently depending on their perspective. If one dimension (say functionality) of the project was met, a stakeholder may be very happy, despite other stakeholders experiencing a feeling of failure as a result of the other limitations (e.g. budget) not being met. There often is a political and power structure conflict between different stakeholders and their different viewpoints will have an influence on the way they experience the outcome of a project (Middleton, 1995). Bartis and Mitev (2008) have even described a successful system that failed. The dominant story was that of success while deeper investigation gave the opposite insight when all the stakeholders were given an opportunity to share their views.

For the purpose of this study the researcher holds that: successful systems are generally within the budget, time and functionality deadlines and should be in satisfactory use.

> For the purpose of this research an IS failure is seen as an information system experiencing problems in any of the areas of time or cost restrictions or user requirements not met, or ways that users judge a system; if it is not to their satisfaction, whether during development or during operation.

As Smith (2001) puts it: *"A failed project is quite easy – it is a project which does not make the journey from conception through to successful implementation."* The view held in this thesis is that a failure can also be an issue during the operational phase of a system.

It is acknowledged that there are other views on this issue. However, people's perceptions on the outcome of an IS project can be different depending on their context, viewpoint or position.

A historical view on IS failures is presented in the next section.

2.2.4 The 'story' of IS failures

The terms IS failure, software crisis and problems in software development have been in existence for several decades. Canimer (1958) referred to failure in the business data processing domain and proposed solutions to avoid pitfalls when computerizing clerical jobs, decades ago. As remarked in the introductory chapter, the first indications of problems in software development and the mentioning of the term 'software crisis' were made during the NATO conferences in 1968 and 1969 (Buxton *et al*., 1969; Naur & Randall, 1968). Developers had similar problems almost four decades ago as those that are experienced by software developers today. The problematic aspects included the perceived complexity of systems, quality issues, communication barriers and so forth.

A seminal work in the software engineering field, 'The Mythical Man-month', refers to the development of the OS/360 operating system that was late, took more memory than planned and cost several times more than estimated. The project manager tried to stabilize the project to prevent a software disaster (Brooks, 1975:iii). This happened in the mid 1960's and the author admits that the system did not perform very well until after several releases. It was after this software development that Brooks began to analyse what went wrong and wanted to see what management and technical lessons could be learned. In doing so, he gave the first book-length case history of a software development failure.

Many developments took place over the years to improve software development processes and practices in order to avoid IS failure. For example, newer or alternative methodologies, improved maturity in development processes, better project management practices, risk identification, etc., have as their key aim the avoidance of IS failure (Gilb & Finzi, 1988; Yourdon, 2004).

Failures have been studied for more than 4 decades and many researchers have contributed to this field (Young, 2005). Lucas (1975) however, was instrumental in changing the view that technical issues alone were at the root of failure causes, when he emphasised that organisational issues had been ignored.

Given the plethora of failure stories - researchers and IS practitioners may experience the inability to succeed. However, Glass (1998) is positive about the software development industry. He reminds the reader of the many computer systems that are in operation in our everyday life, from banking transactions to space applications. He argues that it is often the setting of impossible targets of time and costs in the beginning of a project that causes developers to get the blame for failures. However, regardless of where the blame lies, failed information systems continue to be reported.

A number of surveys have been undertaken in the IS field on the failure phenomenon and on project management issues. Examples of such studies include those conducted by the Standish Group and KPMG. A critique of the Standish reports' statistics on failure was indicated earlier (Chapter 1 and section 2.2.2). Only the negative side of IS project outcomes are shown and a better explanation of the research methods used in these surveys is asked for (Glass, 2006; Jørgensen & Moløkken-Østvold, 2006). Another study looking into IS project performances also differed from the Standish reports by showing encouraging results. Sauer *et al*. (2007)

found that 67% of the projects surveyed are delivered close to, or within the specified budget, time and expectations requirements.

However, IS failures are still prevalent and reported on in the media and therefore it will continue to be a subject to be studied, discussed and researched (Codd, 2011; KPMG, 2005; Kualitatem, 2012). Examples of failures are presented in the next section.

2.2.5 Examples of IS failures

The media often reports on public sector IS failures. It was predicted that in 2005 an estimated $1 trillion would have been spent by organisations and governments worldwide on IT hardware, software and services. Between 5% and 15% of the IT projects initiated, would have been abandoned before or shortly after delivery. Projections of failures such as this occur in every country, in every company and in every government organisation, regardless of status or reputation (Charette, 2005).

The aim of a research centre focused on software failure related issues - the Software Forensics Centre (SFC) - is stated as*: "to improve software development and management practice through empirical work".* The SFC has a repository of failures cases and the following are some examples of failed or challenged systems that are listed, or referred to, on their website (SFC, 2009):

- The London Ambulance system;
- The Melbourne Ambulance system;
- Many public IT/IS projects e.g. the National Insurance Recording System, the Inland Revenue: Pay and File System;
- The Denver airport baggage handling system;
- The Mizuho bank (an online banking system).

Apart from IS failures referred to elsewhere in this document other examples are given below to show the extent of the problem (Anon., 2007; Lyhne, 2007; Moneyweb, 2012; News24, 2007; Telegraph, 2007):

- The State of Florida welfare system: $260 million in overpayments due to computational errors.
- The Seasprite helicopter program for the Australian navy: $1billion spent on helicopters that were grounded due to software problems.
- FBI Virtual Case File, initial cost of $170 million, declared a failure: Numerous requirement changes cost another $104 million.
- eNatis: South African Electronic National Traffic Information System cost ZAR 400 million. The list of problems are numerous and include: inadequate testing, project management 'failures', security problems, roll-back strategy not in place etc. There were many technical troubles since the system was launched in April 2007. Frustrations were experienced regularly when the users and clients of the system could not do transactions as expected. For example, testing stations could not handle normal appointments for learner and driver licenses. Paperwork that the system should have generated could not be delivered and as a consequence certain activities were not possible. Institutions such as banks and insurance companies could not do the official paperwork when cars were sold and registered. Car dealers and vehicle owners have even demanded a presidential

investigation into this debacle as well as into the part played by the Minister of Transport of the RSA, Mr. Jeff Radebe.

- Headline: "£*20bn NHS computer system doomed to fail"*. This is an assessment of the nation's central system for the NHS in the U.K.
- "*Department of Labour to speed-up compensation payout*". Numerous problems with the Compensation Fund in South Africa led to non-payments or very late and slow payment transactions.

All of the failures or troubled systems listed above have features in common: the large amount of financial investment that was wasted; time not well spent and requirements and quality features that were not met. In almost all of the cases above lawsuits followed that aimed to establish who the guilty parties were, so as to sue them for losses and damage. The occurrence of these failures are worldwide and are reported in the media, failure case studies, research papers, public sector account reports and internal reports of companies.

However, often details of IS failures are not shared in the media. Affected users only complain within the walls of the company (Ewusi-Mensah, 1997). Therefore the full picture of IS failures is not available to the public. May (1998) asserts that information on IS failures often relies on subjective assessments as organizations affected by IS failure have already wasted money because of the failure and are not agreeable to more time and money to be spent for the investigation of the failure. Moreover he notes that there are also careers and reputations to be protected.

In the following sections, the terms *failure* and *success* will be contrasted and different views will be offered.

2.2.6 Failure versus success

The research definition of IS failure was introduced in Chapter 1, while Sections 2.2.3 and 2.2.4 presented a more comprehensive view on the term IS failure. To summarise: for the purpose of this research an IS failure is seen as an IS having trouble in any of the time, costs or functionality objectives, whether during development or during use. However, in the 2005 KPMG report on IT project management a key finding that is pointed out is that the definition of success has evolved to include the meeting of promised benefits. An issue that was highlighted in this survey was the keeping of commitments (KPMG, 2005):

"Project success is often a matter of interpretation. For the majority of survey participants, project success appears to equate to achieving an acceptable level of failure or lost benefits."

Objectives are often redefined during a project. This raises the question of whether a project can be defined as successful when compared to the redefined objectives? Consider the case of a project that was three months late and the user required new features before completion. The user was happy with the outcome even though the time objective was not met. Certain questions can be raised: Does success have to be defined against the original criteria, or could it be allowed to evolve? Is it in order to define success from the viewpoint of the user, the project team or sponsor? According to Ewusi-Mensah (2003) cost overruns and schedule delays are almost routinely evident in projects, even in successfully completed development projects. In other words, a project can still be seen as successful by certain stakeholders even though problems have been encountered.

Bignell and Fortune (1984) argue that a particular case can be a success or failure depending the goals of the stakeholder(s) concerned.

It appears that defining success (or failure) is not straightforward and that the viewpoint and goals of the stakeholders play an important role in the perceived outcome of a system.

The 4 top ratings for reasons for success, failure and challenges identified in a survey focusing on project success and maturity (Sonnekus & Labuschagne, 2003) conducted in South Africa, show that success and failure factors are not always in opposition (Table 2.2.) For example, communication infrastructure is included as a reason for success and a reason for failure. Similarly, user needs and user involvement appear in all three categories.

Rating	Reasons for Success	Reasons for Failure	Reasons for Challenges
1	Project team	Communication infrastructure	Requirement definition
2	Understanding user needs	Requirement definition	Handling change
3	Communication infrastructure	User involvement infrastructure	Communication
4	Requirement definition	Executive support	User involvement

Table 2.2 The PROSPERUS report: Top 4 reasons for success, failure and challenges (Sonnekus & Labuschange, 2003)

The CHAOS reports (Standish 1999, 2001) list the top 10 success factors according to their surveys (Table 2.3). The two highest ranking overlapping reasons for success between the South African study (PROSPERUS) and the CHAOS report are skilled staff (the project team) and requirement definition. These results show that although there is a correlation between reasons for success in projects in South Africa and in the USA, there are also unique reasons for failure and success. However, the exact research methods are not known and no definite conclusions can be inferred from these two studies. IS Projects should be approached differently in each country in order to succeed.

The following table (2.3) shows what is called the “Recipe for project success: The CHAOS Ten”, listing the ten most important factors and their associated weights contributing to success in project.

‘People’ issues are in the top three places for project success, a theme shown in the PROSPERUS survey’s results. Emerging from the results are the ‘soft’ factors for success including communication, user involvement and understanding needs. Sonnekus and Labuschagne (2003) point out that this indicates a divide between project teams and end-users.

Success factor	Weight
Executive support	18
User involvement	16
Experienced project manager	14
Clear business objectives	12
Minimized scope	10
Standard software infrastructure	8
Firm basic requirements	6
Formal methodology	6
Reliable estimates	5
Other	5

Table 2.3 Success factors and associated weights influencing project success (Standish, 2001)

From the above tables it can be seen that the literature reporting on IS projects outcomes very often list factors for success and failure. Factors contributing to failures are wide ranging, from inadequately specified objectives and vague requirements to the size and complexity of the project, poor communications (between project members and stakeholders, including users) and professionalism in terms of honest reporting. A table of factors and characteristics of failures identified by researchers over the years is supplied in Appendix 1. Given that failures and factors have been reported over forty years there are no guarantees that any particular 'recipe' would improve the track record of the IT sector.

An overview of remedies proposed by researchers to minimize failure is given in the next section.

2.2.7 Remedies to minimize failure in projects

There have been a number of surveys undertaken on IS failures and this has resulted in many proposals on how to rectify the problem of IS failures. Glass (1998) proposes methods to ward off the software failure for which he uses the term 'runaway'. Risk management must be practiced from the beginning. This implies the anticipation of the serious problems that could occur on a software project and taking the steps to handle them. Issue management is used to handle problems that arise while the project is in process. The issues can be obstacles that tend to arise and threaten to disrupt the progress of the project. Remedies that the respondents to a KPMG survey tried are as listed below (Glass, 1998):

- Extending the schedule.
- Better project management procedures.
- More people.
- More funds.
- Pressure on suppliers by withholding payment.
- Reduction in project scope.
- New outside help.
- Better development methodologies.
- Pressure on suppliers by threatening litigation.
- Change of technology used on the project.
- Abandoning the project.

The preventative action decided on for further projects are (Glass, 1998):

- Improved project management.
- Well conducted feasibility study.
- Increased user involvement.
- Additional external advice.

According to Bentley and Whitten (2007) some of the basic principles to keep in mind, when developing systems, are:

- Keep users involved.
- Use a problem solving approach.
- Do work breakdown by establishing subsystems and phases.
- Manage the process and the project.
- Revise scope and cancel if necessary.

A case study performed by Chang (1995) showed that although user involvement has always been considered an important contributor to IS success, the business environment also affects user involvement and thereby may influence system success. Supporting this view is a case study done at a university where a new system was implemented and viewed as successful by one group of users and rated as a failure by another group of stakeholders (Middleton, 1995). This case illustrates two aspects:

- An IS should fit in with the environment in which it operates.
- According to Middleton this case illustrates that the system designers used the system as a political tool because senior managers were unaware of the importance of this system to the users who most needed it.

A report on New Zealand's public service success rate in IT systems demonstrates how overall IT management contributes to success (Executive Government, 2005). Factors that emerged include:

- Strategic and business planning are linked.
- Clear cut IT management structures are in place.
- IT standards for relevant items exist: software, hardware, user interfaces, policies, etc.
- Project management tools and methodologies are in use.
- Risk management is being practiced.

Another source that identifies a deficient management workforce as a leading culprit in IS failures is West and Bigelow (2002) who state that poor project management accounts for almost 60% of project failures. The article puts forward a method to assess the competency of project managers in order to determine beforehand who has the skills or potential to become a better-quality project manager.

Dabich (1998) made suggestions to help developers learn from the mistakes of others. Three main themes that he pointed out are unrealistic deadlines, inexperienced personnel and competing demands. Dabich argues that projects rarely fail because of technology but often from bad project management or poor people skills or as a result of political reasons. This view is supported by many other authors (Evans *et al.,* 2002; Ewusi-Mensah, 1997; Faraj & Geter, 1998; Middleton, 1995). Other researchers have emphasised planning (Wheatcraft, 2003), aligning behaviour to professional codes of conduct, honesty and transparency (Oz, 1994; Ramingwong & Sajeev, 2007; Ewusi-Mensah, 1997).

The Standish group suggested the following 'recipe' to improve success rates:

- Reduced requirements
- Provision of constant communication systems
- Standard infrastructure
- Skilled stakeholders
- Utilising iterative development processes and project management tools
- Adherence to key roles

Some of these aspects are echoed by people that support the agile software development methodologies (Gilb, 2004). Berinato (2001) reports on the views that Fowler (cofounder of Agile Alliance) and others have on software projects. He states that companies construct software in much the same way that people build bridges. In the building industry a blueprint can be used, requirements do not change often and materials and tools used in the process are standard and predictable. The term agile development, according to Berinato (2001), had been used for a few years, focussing on fast and efficient methods, using less money, incorporating fewer features and spending shorter times on projects.

Although the above recommendations are given, we still experience failure in IS development in recent times (Codd, 2011; Kualitatem, 2012).

Some crucial factors affecting the chances for maximizing successful project outcomes are identified by Ewusi-Mensah (2003):

- Project requirements: understand the domain of the project, note that requirements are volatile and change with time.
- Project audits: project management is critical and audits can be carried out to identify problems.
- Senior management support: it has strategic value if management is committed to the project.
- Project consultants: if the experience level of team members is not sufficient, consultants should be used.

- Project politics: project selection may involve political encounters as power is involved between competing sponsors and champions. Powerful organisational interest may control the development process and if not managed well be detrimental to an IS project.

His view is that the balance between project features, resources and schedule must be maintained at all times to ensure success.

Klein (2007) argues for performing a premortem in a business setting at the beginning of a project rather than doing post-mortem afterwards. The team members work on the assumption that there has been a failure and discuss what has gone wrong. The reasons for failure are discussed and the results lead to improvement of the project plan. The premortem presents the team with prospective hindsight.

The literature reveals that corrective actions proposed above are often the counterpart of the factors contributing to failures. The developing team as well as other stakeholders should recognize the factors that lead to failure and should try to eliminate the problems and improve their practices and methods.

Given the above advice and project strategies to rectify the IS failure situation, why do we still experience failures? This is discussed in the next section.

2.2.8 Why do we still experience failures?

Cobb's paradox outlines:

> *"We know why projects fail; we know how to prevent failure – so why do we still fail?"* (Standish, 1995.)

Software Futures attempt to explain the above paradox. The main idea is that many managers do not understand the nature of the problems they face. The terms "tame"[3] and "wicked"[4] problems are introduced and the conclusion of the reflection on Cobb's paradox is that many IT organisations have wicked problems but try to solve them with tame solutions. Educating professionals to recognize and solve these wicked challenges is perhaps an answer (Software Futures, 2001). Walton (in Computerworld, 2004) discussed the roots of failure in software development management and states that the main reason for failures is the unanswered question about what software development is. He argues that in earlier times (mid fifties) software managers used the analogy of hardware and engineering which is not a true reflection of the field. Another issue noted by Walton is that the problem is not how to do software development well, but how to disseminate what we already know to create a professional and qualified workforce. It comes down to improving methods as well as the ability to educate software practitioners and the businesses served.

[3] According to Software Futures (2001) tame problems can be solved relatively easy as the problems – although complex - are well bounded. A linear approach from diagnosing the errors to finding a solution can be followed.

[4] In order to solve wicked problems an extended and iterative approach is required as problems change over time and no simple, standard or perfect solution exists.

Although much has been written on project failures, not many of the articles and reports have given attention to the approaches to investigate the failures. The factors contributing to failures and ways to address these factors are analysed in abundance in the literature as can be seen from the above descriptions. It was mentioned in Chapter 1 that according to Lyytinen and Hirschheim (1987) more qualitative research methods are needed in the IS failure field. The Royal Academy of Engineering (Jaques, 2004) also argues for better research methods – especially into complex IT projects. Their sentiments are echoed by other researchers as well and efforts have been made in this direction (Fortune and White, 2006; Whyte and Bytheway, 1996; Young, 2005).

The view of Kanellis and Paul (1996) is that developers' perspective of IS adoption and change should be challenged within the discipline. They argue that the IT discipline will continue to be disappointed by IS if the dynamic nature of organisations and the 'exact' identity of IS specification cannot meet one another.

Donaldson and Jenkins (2000) assert that although so much is known about failures and although much literature exists on the topic, there is little evidence of 'work-in-progress'. A few countries such as the UK, USA, Denmark and Sweden had been researching failures. However they face a similar need for better methods to understand failures and to be able to learn from them. The working group studying IT/IS failures in the UK (Royal Academy of Engineering, 2004) supports this view. Glass (2001) provides a number of 'electronic war stories'[5] showing that new types of failures are constantly emerging with greater scope for damage. He also refers to the term 'failure of the computing research field' implying too much focus is given to theory while not enough attention is given to practice. Computing researchers are not often interested in formalising best practices or in learning lessons derived from 'worst practices'. They would rather develop new algorithms or data representations (Glass, 1998).

The 'learning organisation' is seen as an important element in the process of learning from past experiences (Williams, 2003). Most individual companies do not have project review processes in place. Indeed, the failure or success of projects are rarely analysed with the result that much-needed learning does not happen. There can be many reasons for this situation including:

- Insufficient time.
- Lack of motivation.
- No standard methods in place.
- Past post-projects reviews were not helpful.
- It can become a meaningless box-ticking exercise (Turner *et al*. in Williams, 2003).
- Difficulties disseminating the results to the rest of the organisation.

[5] Glass presents cases of today's worst software and e-Business failures anchored in real and recent fact, including failures of strategy, technology, business models, leadership, partnership, and much more. He calls them electronic war stories.

There are many authors that support the use of post-mortems (Birk *et al*., 2002; Dalcher, 2004; Von Zedtwitz, 2002). The editor of IEEE Software classifies 'not learning from past planning' as one of the nine deadly sins of project planning (McConnell, 2001). It seems that the complexity of projects is a contributing factor for the lack of post-project reviews.

A payroll system for the New Zealand Education department that was eventually scrapped after implementation problems is described by Myers (1994). He proposes the critical hermeneutics of Gadamer and Ricoeur as a research method into IS implementation. Although several contributing factors to the implementation problems could be recognized, none of the factors could explain on their own why this system was such a disaster. Myers concludes that the final outcome can only be understood by considering the whole picture. One has to focus on the context of interaction between all the stakeholders and the way that this IS was part of a broader social and historical context. Myers (1994) therefore argues for more suitable research methods for IS implementation taking into account social and organisational issues, which are essential to successful IS implementation research.

Another view on methodology is that of Vickers (1999). A *"non-positivistic, development paradigm"* is advocated whereby IT project development should be more dependent on qualitative, non-positivistic, research methods. This is in order to create a new IT development epistemology that acknowledges people's responses to, and relationship with, IT. Vickers asserts that the current positivistic vehicles of development methodologies are inappropriate for the understanding of organisational problems. Fact-finding should rather be done by qualitative methods such as the use of narratives, ethnography, grounded theory, phenomenology etc., to better understand people and the human experience with IT implementation and use. According to Vickers (1999) the change in IT development methodologies from positivistic to the non-positivistic and critical paradigm can perhaps spare the discipline further IT implementation disasters. This view on thinking about paradigms and methodologies when investigating failures is also supported by Young (2005) who goes so far as to say that much research in this area is irrelevant and that untested approaches are often proposed. Just looking at the history of IS failures suggests that IS research into IS failure lacks relevance (Young, 2005).

It can be derived from the above discussions that different reasons can be given for the current failure situation. Technology alone is not seen as the sole reason for failure, but social and organisational issues that deal with the IS system in its social context with people and its environment also contribute to failure. Indeed, there is work to be done at different levels and further research into IS failure is necessary to address this. It must be remembered that each failure is unique and that it will not be possible to get one ultimate approach of studying all failure types.

The alternative ways for investigating failures is reflected upon in the next section.

2.2.9 Ways of investigating failures

Many efforts have been made towards the improvement of the failure phenomenon over the years. This section presents an overview of some of these approaches proposed in the literature.

Lyytinen and Hirschheim (1987) observe that IS failures are multi-facetted, immensely complex and with no simple solution. It is necessary that the contextual features of IS should be understood and emphasized. They summarize a number of ways in which IS failures can be studied. IS failures should be studied as dynamic processes that can be shaped by the stakeholders' action. The authors refer to the interpretation and mapping of the situation as a way to determine how stakeholders make sense of the situation. They suggest the following four steps to do the mappings:

- Understand how IS is used or developed by building a stakeholder map;
- List the problems that stakeholders face including all features that call for action;
- Link the problem map with the failure reasons;
- Negotiate political consensus as conflict can arise where problem areas are not shared by all the stakeholders.

This process of mapping is not only technically difficult but also requires political and social competence. Lyytinen and Hirschheim (1987) propose a variety of methods to achieve the skills necessary to do the above. These include:

- Role-playing.
- Hermeneutics.
- In-house analysis.
- Study of failure history.
- Quality circles.

They also refer to the establishment of organisational arrangements between stakeholders to meet each other and to be more open. In addition to the above implications for practice, the research implications are also considered by Lyytinen and Hirschheim (1987). The use of empirical methods, field surveys, and experiments are limited in number and scope and they propose further research areas and methods – especially of a more qualitative nature. This latter aspect has been taken up by this researcher and is one of the contributions of the research.

Yardley (2002) uses a case study approach where real-life failures are used to guide the reader through the lifecycle of a project. This is done to learn valuable lessons so that pitfalls can be identified and corrective action can be taken to ensure successful systems.

Other approaches for addressing the occurrence of failures are discussed in Fortune and Peters (2005). They describe the Systems Failures Approach, which draws heavily on system concepts. The goal of this approach is to do a systemic interpretation of a failure or potential failure and its context. They also refer to a few other approaches to understand failures. These approaches are divided into three categories:

- The approaches concerned with project management, which can be applied to IS projects. The critical factor approach is an example of this class.
- Some approaches to understand failures in general can be applied to the IS domain. Failure as an organisational phenomenon is such an approach (Turner in Fortune and Peters, 2005).
- Specific approaches that are developed for understanding IS failures are put forth. In this category a few approaches are listed such as interpretive approaches and interaction approaches. These approaches are derived from the social sciences

founded on the concept that reality is socially constructed, that is, people can understand reality through the interpretation of data.

Another approach is introduced by Dalcher (2004) where narrative methods are suggested. The project, people involved, environment, politics and decisions taken are investigated. When the findings are disseminated a case study is used for the purpose of reporting. Case studies can explore interactions between people and their understanding of a situation. The view of Dalcher (2004) is that the failure case study is a special example of the case study and that the term 'case history' should rather be used. The failure investigation takes place after the failure event. He recommends that case histories can be used to construct, share or dispute meanings of real events, as they contain observations and feelings. Case histories not only contain descriptions of events, they also give perceptions, focus and probably bias.

Failure events are described by stakeholders via stories. Riessman (1993) states that the metaphor of 'story' implies that we create order and construct texts in our specific contexts. To narrate is to impose order on the flow of stakeholders' experience to make sense of events. Narratives link to past activities but also show how individuals understand those actions. Narratives can be used in failures stories to explain why and how failures occur (Dalcher, 2004).

Another view supporting the use of narratives when looking at failure and success is that of Fincham (2002). He suggests that the narrative perspective provides a more 'fully interpretive' understanding of system development. Organisational narratives are seen as sense-making tools that can evolve and change and aid in influencing behaviour. Bartis and Mitev (2008) also use a multiple methodological approach when they investigated an information system failure applying a narrative methodology.

It is the view of this researcher that narrative approaches may aid in the understanding of IS failure and therefore this study concentrates on narrative methods. It is acknowledged that other ways of investigating IS failures may also be utilized to improve the current situation. Pluralistic approaches where combined methods are used may also be possible.

From the above discussions thus far of IS failures and ways to investigate them, factors influencing successful developments and stakeholders involved in the development and use of IS, this researcher has constructed a picture to indicate these intricacies and complexities.

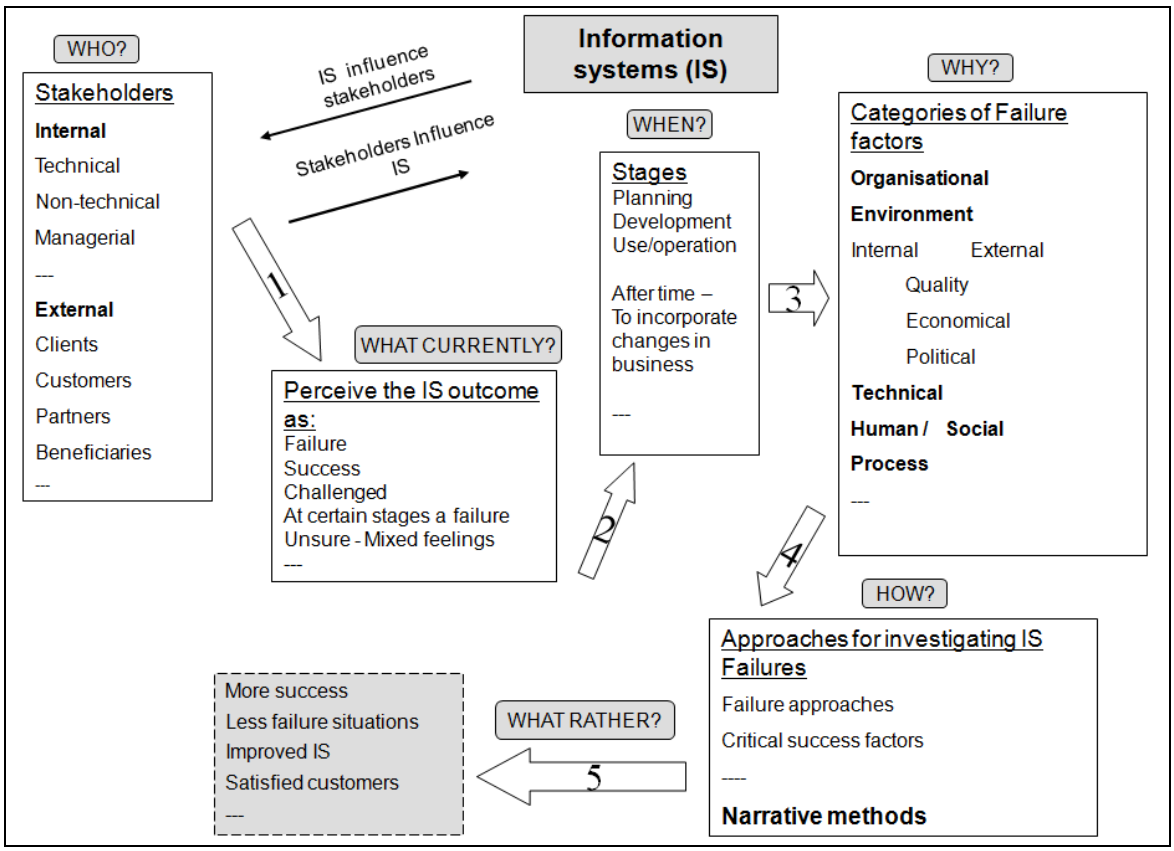

Figure 2.2 A broad view on the complexity of IS failure (own construction)

Figure 2.2 indicates the following aspects within the complexity of IS failure:

- WHO?: These are the different stakeholders that are part of the IS development and use.
- WHAT CURRENTLY?: This indicates the possible outcomes of IS e.g. failure, success, problematic at times as perceived by the stakeholders.
- WHEN?: These are stages when problems may occur- during planning, development or use (also indicated in figure 1.1)
- WHY?: These are IS failure factors and categories as shown in Appendix 1.
- HOW?: These indicate some investigative approaches that are/ can be followed to study IS failures (section 2.2.9 and 2.3 for narrative analysis).
- WHAT RATHER?: This is to indicate what stakeholders rather expect. We want to understand and investigate the issues surrounding IS failure in order to improve IS and have more satisfied stakeholders.

This study aims to address the HOW-aspect and contributes towards the HOW to investigate failures and WHAT-RATHER aspects in figure 2.2.

The link between IS failures and narratives is presented in the next section.

2.2.10 Linking failures and narratives

The terms narrative and story were introduced in the previous section. One of the first forms of discourse we learn as children is the telling of stories. Telling stories about past events is a universal human activity (Riessman, 1993).

From stories follow the interpretation of the constructed narrative. The researcher is concerned with the interpretation of the story in order to generate valid research results. The researcher working with IS failure as their subject receives personal accounts from the various stakeholders representing their own contexts and perspectives. Bartis and Mitev (2008) used combined research approaches including narrative methodology to study a successful IS that failed. In this study it was seen that all perspectives need to be taken into account in that the official story is often not the only story.

In order to make sense of complex failure situations the researcher needs to analyse and interpret the stories of the stakeholders.

Fincham (2002) argues that not only can narratives be used to understand the failure situation, thus becoming a sense-making construct, but they can also be used to persuade people towards certain courses of action. Therefore, the move is away from a potential negative situation (the failure) towards the possibility of success.

Case studies (histories) where people tell their stories from their own perspectives can be used to gather qualitative data on a failure account. According to Dalcher (2004) the combination of case histories and narrative descriptions will more likely lead to clearer failure stories enabling us to make sense of the misunderstandings and contradictions.

It is seen above that attempts were made to make sense of IS failure using narrative (Fincham, 2002; Bartis & Mitev, 2008). The aspect of sensemaking will subsequently be discussed where after narrative approaches are presented.

2.2.10.1 Sensemaking

The importance of narration in organisational communication was indicated by Weick and Browning (1986). The significance of stories in organisations is highlighted in their work not only as symbols of culture but culture-creating devices in the complex environments people live and work in.

Weick (1995) was influential in the area of organisations and sensemaking. Sometimes people want to structure the unknown (Waterman in Weick, 1995) and use frameworks to comprehend, understand and predict. Sensemaking can also be seen as using retrospective accounts to explain what had happened previously using cognitive maps and patterns. Sensemaking is grounded both in individual encounters and in social activity. These frames of minds, or patterns, are seen as interpretation. However, Weick (1995) sees interpretation as a component of sensemaking in that interpretation focuses on some kind of text and sensemaking focuses both on how text is created and applied. In this way sensemaking is "*about authoring as well as reading*". Sensemaking is about a process. An important aspect of sensemaking is that human situations are clarified. "*Sensemaking is about the ways people generate what they interpret*" (Weick, 1995). Garfinkel (1967) made important contributions in the area of understanding and making sense. He attempted to analyse a jury's decision and wanted to know how they knew how to act as jurors. He created the term

"Ethnomethodology" as an approach to describe how people use different methods in order to comprehend the culture or environment they live in.

Weick (1988) argues that sensemaking is more difficult in crisis situations because action – which is instrumental to understanding, can intensify the crisis. He uses the example of a gas leak to show that we learn more as we gain more actual experience in crisis situations. Another example of failure that Weick (1993) used is the "*Mann Gulch Disaster*" where thirteen men died in a fire tragedy. He analysed the disaster using organisational theory to indicate that we sometimes have gaps in our current understanding of organisations. Various forms of qualitative data were used for sensemaking in this case. Organisational research often focuses on strategic rationality and decision-making. However, this more rational model ignores the "*inherent complexity and ambiguity*" of real environments. Sensemaking is a device that people may use to make sense retrospectively from their situations. Urry (2003) states that sensemaking means the making of sense or to give structure to the unknown or to put things in a frame of reference. He uses complexity, stating that systems move between order and chaos and at times there may be unexpected results. We also live and work in a networked society and these networks create complex connections that stretch across time and space. This indicates the complexity within organisations where activities and transactions have to be done. These complexities, connections and global and social order/disorder, are some of the challenges that researchers have to face. Moreover - systems are not always in equilibrium.

Official or agreed accounts are useful in the organisation and they are an important means of sensemaking in the organisation (Brown & Humphreys, 2003). There may however be contested accounts that contradict the grand narrative. These accounts are also important as they challenge the current views and lead to new learning. (Reissner, 2008; Brown *et al*., 2008). People very often interpret the experiences they have in common with others differently. Reissner (2008) argues that there is an interplay between "*change, organisation, learning, sensemaking and narrative*" that is important to explain how organisations learn in terms of change. There is however much complexity in these situations and this poses a challenge to the researcher.

Reissner (2008) authored the book "*Narratives of organisational change and learning - making sense of testing times*" where the main device to make sense individually and collectively is stated as narrative. The voices of the stakeholders are heard to make sense of change in situations in organisations. Weick (1995) discussed seven properties of sensemaking that distinguished sensemaking from other forms of explanatory methods such as understanding and interpretation. These seven characteristics are given below and lines are drawn between these properties and narratives to indicate how they intertwine:

1. Grounded in identity construction

   Sensemaking starts with a sense maker. We make sense of what goes on around us by asking what implications there are for us or for me (individual)."*What the situation means is defined by who I become while dealing with it...*" The identity that is adopted while dealing with a situation will lead to what the situation meant. The more selves that a person has access to imply more meanings that can be imposed in any situation. In

narrative inquiry, the role of the researcher is important and this is discussed in the work of Clandinin and Connelly (2000) as a persistent concern. Researchers are made aware of wakefulness and they should reflect upon how researchers are storied. They should be aware of the identities of the researcher and the participants.

2. Retrospective

Retrospect is an important characteristic of sensemaking. Schutz (in Weick, 1995) used the terms meaningful lived experience. The reality is that people only comprehend what they are doing after they have completed it. Mead (1934) previously stated that we are conscious of what we have done after the fact and not while doing it. Experience stands out here and in the field of narrative analysis. Clandinin and Connelly (2000) also focus on experience as a key term when doing narrative inquiry. Sole and Wilson (2002) state that stories are a communicative form to share experience in various professions.

3. Enactive of sensible environments

People construct reality through authoritative acts and sensemaking assumes action. Narrative inquiries are situated around experience that happened in an environment. It is seen that people help shape the environment they are in. In this sense, narrative inquiry can be conducted in many environments or application areas. This study focuses on the IS failure field.

4. Social

Sensemaking is not only focusing on the individual level of analysis, indeed it is a social process. In organisations there are networks of shared meanings and interactions as well as opposing ideas that might give cues for further understanding. Clandinin and Connelly (2000) also include the personal and social dimensions when undertaking narrative inquiry. Reissner (2008) also adds to the notion that sensemaking is both a collective and individual process and there may be competing stories.

5. Ongoing

According to Weick (1995) sensemaking never starts and duration never stops. People take things out from continuous flows but they are always in the midst of things. Clandinin and Connelly (2000) refer to a continuity dimension. Boje (2008) uses the terms interactions in time and space and states that stories are unfolding and unfinished. Reissner (2008) also adds to this that even the findings of a research project (which may seem as the end) may be a starting point for further inquiry.

6. Focused on and by extracted cues

Sensemaking is not always swift and straightforward. Cues are extracted from a situation in a specific context and from personal dispositions. According to Starbuck and Milliken (in Weick, 1995) one should distinguish between noticing a cue e.g. filtering and classifying and then the actual sensemaking that refers to interpretation and determining what the cues mean. This issue of context are resonated often in the narrative field (Boje, 2001; Boje, 2008, Clandinin & Connelly, 2000; Riessman, 2008; Reissner, 2008).

7. Plausibility rather than accuracy

According to Weick (1995) sensemaking is about plausibility, coherence and reasonableness. This corresponds to ways that qualitative work in information systems are judged for quality in Oates (2006) and in narrative inquiry in Clandinin and Connelly (2000). No one truth can be derived (Lieblich *et al.*, 1998). There can be many constructions of reality but Weick (1995) calls it a "*good story*" – adequate for the time, place and context in question.

The ability to talk and the use of language is the one thing that differentiates humans from the natural world. Language is also central to sensemaking and organisational learning (Weick *et al*., 2005). Weick continues in the second volume of his book on making sense in organisations the topic that organizations "*are interpretation systems that scan, interpret, and learn*". There are cycles of interruptions and re-organising and recoveries in organisations (Weick, 2009).

It can be derived from the above discussions and the seven properties of sensemaking that narrative is interweaved with sensemaking. This supports the use of narrative approaches in this study where the experiences of stakeholders in information systems are explored.

2.3 Narrative

2.3.1 Introduction to narrative

Narrative studies have grown during the last decade or so and have earned a place in the theory, application and research of various disciplines (Lieblich *et al.,* 1998). Mostly the disciplines of life and social sciences are mentioned, including psychology, psychotherapy, education and history. It is referred to as the 'narrative revolution' and a demise of the positivistic paradigm in social science (Bruner in Lieblich *et al*., 1998). It is important to notice that the repertoire of social sciences has been enriched with the narrative methodologies. It seems that narrative use and application precedes the formalization of a philosophy and methodology. Future work to develop the field of narrative research can focus on approaches to analyse narrative material and develop techniques to be employed in relevant studies. The question arises whether narrative methodologies can be used in other sciences as well.

This section describes what narratives are and presents definitions. Next, the question of why narrative is included in this research is answered. The history of narratives and the development of this research area are discussed as well. The section furthermore shows specific ways that narratives are used in research. Approaches that may be useful for describing IS failures are then presented.

2.3.2 What are narratives?

McQuillan refers to a now taken for granted assertion of Barthes in 1966 (McQuillan, 2000:2).

> *"the narratives of the world are numberless… All classes, all human groups, have their narratives, enjoyment of which is very often shared by men with different often opposing, cultural backgrounds. …Narrative is international, transhistorical, transcultural: it is simply there, like life itself."*

Cohan and Shires (1988) put it very simply: *"A narrative recounts a story, a series of events in a temporal sequence"*. They go further to say that there is a need to study narratives because stories structure the meanings by which a culture lives. There is a variety of narrative around us: myths, songs, essays, biographies, news accounts and so forth.

Prince (1982) also refers to Barthes assertion who presents a broad description of narrative as saying there are countless forms of narrative in the world. There are a variety of genres and media to accommodate man's stories. Narrative is present at all times, in all places and starts with the history of mankind. All human groups have their stories. Indeed, narrative is universal and varied and is the representation of events that can be real or fictive in a time sequence.

Cortazzi (1993) applies narrative analysis in the area of teachers' culture and thinking. He summarizes the importance of narrative by giving a few researchers' (Hardy, Polkinghorne, Mitchell, Bruner, Branigan and Chafe) views on narrative. Narrative is:

- *"a primary act of mind ";*
- *"the primary scheme by means of which human existence is rendered meaningful";*
- *"a means by which human beings represent and restructure the world";*
- *"the organizing principle by which people organize their experience in, knowledge about, and transactions with the social world";*
- *"a perceptual activity that organizes data into a special pattern which represents and explains experience";*
- *"overt manifestations of the mind in action: windows to both the content of the mind and its ongoing operations".*

When narratives are analysed there is an opening of the window on the mind of the individual or the opening of a window on the culture when a group is concerned (Cortazzi, 1993). Narrative analysis has as object the story itself (Riessman, 1993). Narrative analysis is not easily defined as there exists many approaches to analyse and interpret the accounts of people. Wood and Kroger (2000) state that narrative analysis refers to a wide variety of approaches within many disciplines and sub disciplines. Furthermore, the terms narrative and account are often used interchangeably. Narrative analysis is one of many interview driven approaches and it is one of the modes of qualitative inquiry which is successfully used in therapeutic encounters (Padgett, 2004).

In a book on narrative research edited by Clandinin (2007) it is presented that there are multiple ways to do narrative analysis and interpretation. Clandinin was planning to include a chapter on narrative analysis but such a chapter was omitted because of the numerous ways of conducting narrative analysis and interpretation. What rather happened was that the contributing authors described their ways of doing narrative work by means of exemplars, giving attention specific to context. This accentuates the difficulty surrounding the ambiguousness of defining and conducting of narrative analysis.

This section has looked into several viewpoints of what narrative and narrative analysis are and it is shown that definitions regarding narrative research are not so common to find. McQuillan (2000) refers to the definition of narrative as unstable and still *"up for grabs*". The

term “is elastic” and no single definition can do justice to what it means to the many people that use the term and participate in narrative studies.

> For the purpose of this study the term narrative will be used to refer to stories that stakeholders recount from experiences they were part of in order to ‘open up’ the activity that they had and what they are still in or what they envisage for the future.

The stories that are collected as narrative descriptions are studied by narrative researchers in diverse ways. There is not a single research approach to follow that is the right one. Chapter 3 elaborates on the research approach for this study.

Next, the question of why narrative was chosen as a way to inquire about IS failures situations is addressed.

2.3.3 Why narrative?

Lieblich *et al.* (1998:7) asks the question “why should one conduct narrative studies?” (This is in the field of Psychology). Lieblich and colleagues refer to people as natural storytellers and these stories play a role in communication between people to provide coherence and continuity to peoples’ experiences. We learn about the inner world of people through verbal accounts. Stories are usually constructed around core facts of an event but people tend to build their stories on remembered facts and their interpretation of it. Life stories are subjective but contain ‘narrative truth’ which could be the same or somewhat different than the historical truth (Spence, 1986 in Lieblich *et al.*, 1998). Researchers may use these stories to discover identity and understand it.

Although a particular story of an account may be one instance of the polyphonic versions of the many possible presentations of people’s experiences it can still be used in narrative research. Information and meaning of culture and social worlds are also conveyed through peoples’ stories.

Clandinin and Connelly (2000) describe the research and practice of five authors who included narrative in their work. In doing so, new dimensions are given to narrative inquiries. The authors’ work stems from diverse disciplines such as psychotherapy, anthropology, organizational research, psychiatry and teaching. What is added to the body of knowledge from this is that we can borrow terms, theories and metaphors from other disciplines and in so doing bridge practice and research. This research borrows then from the narrative domain and imports methods to the field of IS failure research. IS failure situations represents experience and narrative is an adequate way of representing and understanding experience. As such, narrative is a phenomenon as well as the method used (Ibid.). Experience happens narratively and can be studied as such. Rosile *et al*. (2013) contributes to the use of narratives in organisations and state that *“storytelling inquiry is especially rich as a vehicle to study processes and material conditions occurring inside the organisation”.*

There is also a call towards more and alternative research from both of the foci of this research namely:

- For improved understanding of the IS failure phenomenon and other methods (Bignell & Fortune, 1998; Fortune & Peters, 2005; Lyytinen & Hirschheim, 1987; Young, 2005).
- For conducting narrative work in more domains and in different ways (Boje, 2011; Clandinin & Connelly, 2000; Clandinin, 2007; Mishler, 1991).

Narrative approaches can enrich the discipline in which the phenomenon under investigation resides – in an augmented way with other methods. Through hearing and telling stories, certain issues could be highlighted and further questions are raised (see also section 3.1.1 where eclecticism is discussed). The literature survey undertaken for this study reveals and encourages more researchers to develop a method – *"a way of talking and asking and answering and making sense - that will allow narrative to flourish in this congenial moment for stories."* (Pinnegar & Daynes, 2007).

This is why narrative is part of this story. A short history of narrative is presented in the next section.

2.3.4 History of narrative

This section gives a brief history of narrative theory in the twentieth century. McQuillan (2000, xi) sketches the history of narrative theory in a few sentences in a story format:

> *"In the beginning there was Aristotle who theorised 'plot', then there came the novelists who theorised their own plots, then after some false starts (Propp, Benjamin, Bakhtin) narrative theory really took off with narratology (the structuralist-led 'science of narrative'). However, like the dinosaurs, narratologists died out and were replaced by more mobile, covert forms of narrative theory within a 'post-structuralist' diaspora. Narrative theory now lives on, embedded in the work and tropes of post-structuralism".*

Although the style of the above paragraph is bit light-hearted the story sheds light on the past few decades of narrative theory. According to Du Plooy and Viljoen (1992) the study-field of literary theory shows the bewilderment, though fruitfully diverse, of narrative approaches, paradigms, theories and terminology. There are always movements and very few acknowledgements of limitations and boundaries in this field. The changes in the literary science over the past decade are as a result of many factors including development of the literature itself as well as scientific, social, political and philosophical changes in the twentieth century. Texts are very important for communication and mutual understanding in the global village of today. Furthermore texts include all products of human sense making for example advertisements, films and books. The previous century's literature study was influenced by two worldviews of science, namely Positivism and "*geistesgeschichtliche*". The work of Comte highlights the causal relationship between the literary work and race, milieu of moment, author and so forth. Positivism wants to explain a literary work in terms of universal laws. The "*geistesgeschichtliche"* method looks at the uniqueness of the artwork and tries to understand the work through intuition, experience and understanding of the current spirit of time. The work of Dilthey is an example of this method. There was severe reaction against these two approaches early in the twentieth century. In the course of the new century new dynamic

literary paradigms develop. A timeline from 1900 with main issues, contributors and examples of work in the field of narrative theory[6] is presented in table 2.4.

Time	Important issues	Who	Example of work
1900-1910 Modernism	Modernism highlights the importance of narrative in the experience of the external world. Experimental writing is produced-recognizing the structural and contingent nature of narrative. A new science – that of psychoanalysis also used narratives.	Joseph Conrad, Henry James	W du Bois: The souls of black folk, S Freud: Creative writers and daydreaming (1908)
1910-1920 Russian Formalism	Climax of Russian formalist approach to narrative between Bolshevik revolution and Stalinist repression. Formalist techniques introduced to Europe. Duality of narrative (sjuzhet) and story (fibula), then poetics.	Roman Jakobson, Viktor Shklovsky, Ferdinand de Saussure	V Shklovsky: Art as technique (1917), TS Eliot: Tradition and the individual talent
1920-1930	The formalists were attacked by Trotsky, and later by Soviet Commissar for education. Attempts to reconcile formalism and Marxism. Some fled to Prague. Exponents follow Soviet orthodoxy. Studies look at the morphology of the text.	Jakobson – important figure recognized by Prague linguistic circle, Mikhail Bakhtin	P Lubbock, The craft of fiction, V Propp: Morphology of the folktale
1930-1940	Formalism complemented by a focused consideration of narrative and history – as result of unorthodox thinking and response to ideological contests. American structuralism and new criticism.	William Benjamin, George Bataille, Brooks	W Empson: Seven types of ambiguity, W Benjamin: The storyteller
1940-1950 Phenomenological circles, New Criticism (Anglo American)	Phenomenological and linguistic circles in Europe – leading to future structuralism. Literary critics move away from formalism towards European philosophy.	Heidegger, Jean-Paul Sartre, Maurice Blanchot	V Propp: Oedipus in the light of Folklore, E Auberach: Mimesis
1950-1960 Beginning of Structuralism	Work in French, not so much known in English. French structuralism. Issue of language also in Anglo American thinking.	Noam Chomsky, Austin, Lévi-Strauss	R Barthes: Mythologies, N Frye: Anatomy of criticism
1960-1970 Structuralism,	More theoretical approaches develop alongside each other and influence each other. Structuralism is an intellectual force, also in English. New Criticism develops own tradition of formal narrative analysis. Interest in French thinkers emerges. American structuralism develops. American folkloristics.	Barthes, Derrida, Lacan Scholes, Kellog, Chatman	W Booth: The rhetoric of fiction R Barthes: Introduction a l'analyse structurale des récits
1970-1980 Post	Anglo American reception of recent French thought, new reader-response	Barthes, Lacan et al published in	J Miller: Aspects of narrative,

[6] Boje (2014) prefers the term storytelling theories and philosophies rather than narrative theories. He often focuses on storytelling in organizations. Boje (2014) presented a timeline of storytelling philosophy as a genealogy where genealogy is then also seen as a kind of storytelling.

structuralism, beginning of deconstruction	theories. Barthes and Lacan are published in English. Psychoanalysis and narrative comes together. Narratology is well established in English. Semiotic analysis of texts. Deconstruction coming.	English by British film journal: Screen, Jacques Derrida, Harold Bloom,	G Genette: Figures III, S Heath: Narrative space, U Eco: Role of the reader
1980-1990 Deconstruction	Narrative theories disseminated as critical theories (Anglo American). Structuralism has all but died out (France). Russian heteroglossia. Psychoanalysis combined with gender. Textbooks on narrative become available. Discussion of narrative focus of postmodernism. Narrative is considered by Post-structuralist analysis philosophy. Models for the analysis of texts.	Homi Bhabha, James Phelan, Paul de Man, Horst Ruthrof, Mieke Bal, Gerald Prince, Paul Ricoeur	W Mitchell: On narrative, J Lyotard: The postmodern condition, M Bal: Narratology, P Ricoeur: Time and narrative
1990-2000 Post-structuralist diaspora Post classical approaches	Narrative analysis used widely - not only in literary studies. Interdisciplinary and post narratological spaces inquiries. Topics such as race and sexuality are of interest..	Mieke Bal, Paul Cobley Jean Clandinin, Czarniawska,	P Gilroy: The black Atlantic, T Minh-Ha: Woman, native and Other, J Bebin-Masi: Narrative in Nice, Style
2000 – current More post classical approaches Living story, Antenarrative, Materiality, Quantum storytelling	More areas are investigated, Other areas include: narratives and law, ethics, IT, space, film, history, organisations, cross-cultural, education, visual narratives, complexity etc	David Boje, Jean Clandinin, Czarniawska, Rosile *et al.* Hedy Bach	Rosile *et al*.: Storytelling diamond, Boje & Tyler: Workaholism (Business ethics), Composing a visual narrative inquiry

Table 2.4 Timeline of the development of narrative theories (Own construction– main source: McQuillan, 2000; other sources: Boje, 2001; Boje 2011; Boje, 2014; Cloete, 1992; Clandinin & Connelly, 2000; Du Plooy, 1986; Rosile *et al*., 2013)

Due to the literary theories branching out frequently and with multi-facets during the twentieth century there are now a number of theories that are concurrently worked on and being used. The paradigm of the last quarter of the twentieth century is referred to as theoretical pluralism. Development is seen as a universal phenomenon. When science and technology develop, it also changes our daily lives. When humans' lives change it will also be reflected in their literature. The theories that are developed to analyse and describe literary texts must supply methods to do so adequately. According to Du Plooy (1986) the researcher has the freedom to choose from the whole wealth of literary scientific theories, terminology and methods what he/she needs to describe and analyse a text. The work/text should give the necessary indications of what is important for analysis and description thereof.

There were over time historical turns to indicate the move towards narrative inquiry. Changes that occurred include the following ways:

- The change of relationship between researcher and the researched

- The move from using numbers toward using words as data
- The change in focus from general and universal towards specific and local
- Accepting alternative epistemologies or alternative ways of knowing
- New application areas are used for narrative analysis

From the above discussions it is seen that the development of theories looking at literature and other texts has taken place over many years and that distinct methods to conduct narrative analysis do not exist. Cross influencing happened over time and researchers adapted ways that suited their areas under investigation and context.

The next section presents a selection of classical and post-classical approaches for analysing narratives.

2.3.5 Narrative approaches

This section presents and describes certain methods for conducing narrative analysis.

Lieblich *et al.* (1998) classify narrative studies in three main domains, namely:

- Studies where narrative is used for investigating any research question. The narrative inquiry can be used in basic and applied research. Narrative methods are appropriate when real life problems are under investigation. This study belongs to this domain.
- Studies that investigate the narrative as their research object. Here the narrative is studied rather than using narratives to study other questions.
- Studies in the philosophical and methodological aspects of qualitative research approaches where narrative is one of them. Lieblich *et al.* (1998) refer to important contributions in the philosophic arena but state that where narrative methodology is of concern the classification of methods is rare in the literature.

Mishler (1995) also contributes to the classification of narrative studies on the ground of central research issues. Three perspectives on narrative are given:

- Reference and temporal order, indicate the order of events in the narrated story in relation to the order of events in real time.
- Textual coherence and structure, where the narrator's intention and narrative and linguistic strategies that are used to generate the story are of interest to the inquiry.
- Narrative functions, refers to the wider contexts of the narrative in the cultural and societal domains.

A model is proposed by Lieblich *et al.* (1998) to classify types of narrative analysis. Firstly the dimensions of holistic and categorical approaches emerge and secondly the content and form based modes of a story are defined. This study will investigate these approaches as to ascertain their viability in relation to the research questions.

- The holistic approach takes a story as a whole and sections are then interpreted in context with the other part of the narrative.
- With the categorical approach the original story is dissected as in traditional content analysis. Single words of sections that belong to a category are collected from the story and from other texts (from different narrators).
- The content-based approach refers to the content of an account to answer the questions: why?, what?, who? from the teller's viewpoint.
- The form-based approach ignores the content of a story and looks at its structure, sequence of happenings, feelings evoked, choice of words and so forth.

Another method that is described in the literature is the "Critical incident technique" (Burns *et al*., 2000), where narratives are shared about errors and critical incidents. Flanagan (1954) suggests using this technique as: "a means of identifying a significant or critical behaviour or factors that contributes to the success or failure of some human event". Steps that can be taken in this approach are:

1. Focus on a phenomenon/event.
2. Elicit narrative text record of the informant's experience with the phenomenon.
3. Conduct a content analysis of narrative texts.
4. Perform thematic interpretation from the content analysis.

Ekman and Skott (2005) describe the process of developing clinical knowledge through a narrative-based method of interpretation. Narrative analysis is shown in the context of healthcare. This was inspired by Ricoeur's ideas pertaining to interpretation of text. Five steps are given to achieve this:

1. General or naive reading.
2. Distancing – looking at linguistic and grammatical forms of the text.
3. Examination of discourse – different voices.
4. Conjectures and questions – meaning of the text.
5. Reflection over the whole, deep comprehensive understanding.

Du Plooy (1986) describes literary theory as a narrative approach and shows that when a text is analysed and interpreted we can study certain elements and aspects in the text such as:

- Events
- Actors/Characters
- Time
- Place
- Language and words used
- Psychological issues
- Political concerns
- Ideological issues

During the literature study of narrative methods and IS failures the above aspects were taken into account to plan a narrative strategy to follow and be of guidance to analyse and interpret accounts in more depth. It was anticipated that IS failure accounts will be understood on a deeper level, thereby putting the researcher in a position to generate a more comprehensive description and explanation of events.

These abovementioned methods can be classified as the more classical narrative approaches. Newer approaches were introduced and used over time whereby certain aspects of narratives were deeper investigated and explained. Clandinin and Connelly (2000) for instance made use of the three-dimensional narrative inquiry space. These include aspects such as time and continuity (past, present, future), situation (place) and interaction (personal and social). The livingness of stories could not be ignored, however many narrative researchers became absorbed with what to pick up from stories e.g. categories, themes etc. Stories began with

living things, and the interactions of people at a certain time in a specific space have to be taken into account when narrative analysis is done. Thus more post–classical approaches were developed and inspired where narratives are treated as living entities. Researchers attempt to make sense of narratives as they are lived (Clandinin & Connelly, 2000; Clandinin, 2007).

Another repertoire of approaches has been introduced by Boje (2001). He advocates in his book on narratives the use of 'antenarrative' methods to take into account that stories appear to be told improperly: in a fragmented, multi-plotted and complex manner. He sets out eight antenarrative analysis options that can deal with fragmented and polyphonic storytelling. The question that is now asked is: can the use of narrative and antenarrative analysis help in other research fields as well and in particular for this study – can narratives be used in the field of IS failure research to get a more complete understanding of complex interactions. Boje (2001) defines antenarrative as 'this fragmented, non-linear, incoherent, collective, unplotted and improper storytelling' that is the story in an *ante* state of affairs before a constructed narrative is used to impose sense. The eight options he describes are (Dalcher & Drevin, 2003):

1. Deconstruction:

   When evidence is collected it is clear that every story: has a worldview, is part of other stories or events and has another side. Deconstruction challenges the researcher with linearity, sequence, voice and plot.

2. Grand narrative:

   When stories are analysed it is important that grand narratives must be looked into and see how many smaller stories exist within. Each story is an intertextual network. Other voices can be embedded in the grand narrative.

3. Microstoria:

   Researchers using this approach use the 'little people's' histories and ignore the 'great man' accounts that are most often used in organisation studies. Microstoria relies upon archival evidence found in notary records, property registries, pamphlets, trial proceedings, etc. Clues from non-elite persons and places are used and exceptional cases are used.

4. Story network:

   In antenarrative analysis the researcher tries to trace the storytelling behaviour in the organising situation. The organisation is seen as a storytelling system.

5. Intertextuality:

   This approach is not used much in organisation studies. Intertextuality is the dialogue that goes on between and in narratives. Many voices contribute to the stories that need to be analysed.

6. Causality:

   The casual field to work in is often messy and complex. This approach looks into how people put fragments of story together into causal assertion.

7. Plot:

   Who gets to author the narrative in emplotment of complex organisations? Are other emplotments feasible? The readers and writers of a plot must get into intertextual dialogue.

8. Theme:

   Storytelling moves beyond the limits of hierarchy and classification. The researcher focuses on what was between the lines and what was left out.

The alternative ways that Boje (2001, 2011) has assembled mainly focus on multi-stranded stories of experiences that lack collective consensus. This developed further into prospectiveness in stories in order to predict future outcomes (antenarrative). Antenarrative means *before* story and *bets* on the future. It is thus a double meaning of before coherent narrative and bets on the future to come (Boje, 2014). Rosile *et al.* (2013) add to the research methods field of storytelling and state that *"antenarratives make a connection between narratives and living stories".*

The question that emerges is whether these or other methods are suitable to be used to conduct comprehensive IS investigations so that the software development community can begin to learn from past mistakes and make sense from IS users' experiences.

2.3.6 Narratives and IS

Narrative was previously used in the IS project field (Drevin, 2009) in studies e.g. in the area of evaluating projects (Hedman & Borell, 2005), the examination of information requirements (Alvarez & Urla, 2002) and understanding the environment and the relationships in it (Remenyi, 2005).

It was shown in section 2.2.10 that narrative methods have also been proposed to study IS failure. Fincham (2002) already shows that the narrative perspective on success and failure can aid to influence people's behaviour and move from failure to success. In the process people's narratives may change and evolve (Bartis & Mitev, 2008). People are storytellers by nature and in this study the participants' stories are used to understand their experiences of the IS under investigation.

Dalcher (2004) also suggest narrative methods in order to take into account the project, people involved, environment, politics and decision-making. These aspects can then be used for reporting purposes. Dalcher and Drevin (2003, 2004) elaborate on narrative as method for studying IS failure.

2.3.7 Narrative approaches used in this study

As a result of studying the different narrative approaches the researcher selected three broad categories of methods in this study.

1. Retrospective narrative analysis

   The phenomenon under discussion is analysed in terms of certain elements such as structure, plot, beginning, middle and end, characters and so forth. This is a classical way of doing narrative analysis. (Most of section 2.3.5 discusses this approach).

2. Living story

   This is a post-classic approach where narrative is treated as a living story looking at elements such as movement, multi-voices, networks and non-linearity. Living story

highlights contexts, there are turnings and morphing of stories between accounts, there is a collective force of authors (Boje, 2007). Stories are not told properly with beginning, middles and ends. They are told in fragments, polyphonic at times, with interactions from those involved. Tyler (in Boje, 2014) also states that stories have "*aliveness*", whether they are told or not. Clandinin (2007) states that living story helps to understand and explore human interaction and practice. Many authors can contribute to the story and multiple perspectives and voices are apparent (Rosile *et al*., 2013). This is the second approach that was chosen for narrative analysis in this study.

3. Antenarrative

Antenarrative was initially introduced by Boje (2001) to "stretch" the traditional narrative approaches to include incoherent and unstructured accounts. Antenarrative was used to include pre-stories – before a proper narrative is constructed. Later prospectiveness was added to include forward-looking in the setting (Boje, 2008; Boje, 2011). What can be shaped in the future? Examples of elements of this approach are prospectiveness, dynamics, non-linearity and little stories. This post-classical approach is the third analysis method that was chosen for this study.

When the narrative approaches were investigated, these approaches seemed to be applicable ways of studying and making sense of the stories of the involved actors, as incoherency and multi-plotted narratives were evident as many different perspectives were shared by the different IS stakeholder groups. These three approaches also include traditional methods as well as modern and new ways of investigating an environment or setting (e.g. IS failure). Rosile *et al*. (2013) also use the term storytelling as Boje (2014) and imply that there is intraplay of grand narratives with living stories within storytelling. Then *"antenarratives make a process connection between narratives and living stories" (*Rosile *et al*., 2013).

It is outside the scope of this study to describe every possible way of doing narrative analysis on IS and failures stories.

The following matrix is used to summarise important aspects of the chosen narrative approaches used in this study. The different narrative approaches are shown as column headings. The row headings present certain elements including features or characteristics of the specific narrative method. The constructed framework of narrative methods is given in table 2.5.

Approach ⇨ *Aspects /features of approach* ⇩	*Method 1*	*Method 2*	*Method 3*
Type of approach	Classical	Post-classical	Post-classical
Theory	Narrative	Living story	Antenarrative
Main focus	Retrospective	Now and here	Before coherence, Prospective, future
Form	Linear	Non-linear	Linear/Non-linear
Main objective	Identify story elements, structure	Identify livingness, webs of story-to-story	Between processes, how lived experience is shaped, Identify future elements
Objective/Aim	Looking retrospectively at the phenomena	Understand, see interaction, get meaning in context, livingness,	Understand, read between the lines, get small stories, what is not said, future aspects
Perspective	Mono-voiced	Multi-voiced	Multi-voiced
Deliverables	Categories, narrative with beginning, middle, end, structure of story	Narrative in context, understanding interactions in time and space, taking into account the livingness, learn lessons	Bigger, comprehensive picture - where all participants voices are heard, make prospectively sense, learn lessons

Table 2.5 Initial framework of the three narrative approaches (Own construction – Sources used: Bal, 1991; Boje, 2001; Boje, 2011; Clandinin & Connelly, 2000; Du Plooy, 1986; Riesman, 1993; Rosile *et al*., 2013)

This framework is further enhanced and updated as the research process progresses through this study. The end result is given as a contribution in section 7.4 table 7.7.

The next section summarises this chapter.

2.4 Summary and conclusions

This chapter has considered different definitions of the failure notion as discussed in the literature. It seems that cost and time overruns as well as the non-compliance with functional requirements are the focus of most of the definitions. A short history of the failure phenomenon has been given. We have seen that the terms failure, crisis, and problems in IS development have been in use for a long time. However, not all researchers share the same negative sentiment on IS development outcomes.

Several factors that contribute to IS failure and successes were discussed and possible remedies to try and correct or improve the situation were discussed. The question of why failures still occur was discussed. Many reasons and explanations were given including software developers not understanding the problem they need to address, education, changing environments, limited research methods in this field, etc. It was shown in the discussion that the information on failures should be disseminated to the appropriate people

in an organisation. We need ways of making sense of past events as to use this information as best as possible. Information systems are used in an organisational and social context and therefore the methods of looking into IS issues should map to the context of IS.

It was shown in the above discussions that there is a lack of success in understanding failures. Some authors advocate more reliance on interpreting the views and stories of stakeholders and the narrative is put forward as a device for making sense from failure incidents. It is necessary to interpret information on failures and this qualitative perspective relies on words, which in turn convey feelings, perceptions, expectations and beliefs. It would be difficult to use quantitative methods alone to make sense of failures. This is where narrative methods are proposed to be used to interpret the rich subjective information inherent in a failure situation (see Figure 2.2).

This chapter also presented narrative analysis approaches used over the years by many narrative researchers and practitioners. Classical and post-classical approaches were described. A framework was constructed showing the main features and foci of the three approaches chosen for this study. The three lenses that are used for analysis of stakeholders accounts of their IS experiences are retrospective narrative, living story and antenarrative. These analyses are presented in chapters 4,5,6 and in the appendix.

The research methodology used in this study is discussed in the next chapter where the roadmap that guided this study is presented.

Chapter 3 Methods

3.1 Introduction

A number of important changes have taken place in the area of research methods over the past two decades (Roberts, 2002). This includes the prominent place given to qualitative methodologies alongside their more, traditional quantitative counterparts. In this context the term 'method' has broadened to 'methodology' to include the whole research process and its stages, worldviews, research design and theorisation. The aim of this chapter is to describe research-related concepts such as methodological and philosophical issues in general, as well as to explain how research methods have been applied in this study. The research process for this study will also be presented in this chapter. Aspects such as data collection and analysis, the role of the researcher and some challenges that the researcher had to overcome will be discussed. As an initial reflection of the research approach for this study, an overview of qualitative work, narratives and transfer of methods between disciplines are presented.

3.1.1 Qualitative Research

Qualitative research methods were developed to enable researchers to study social, cultural and organisational phenomena (Myers, 1997). The majority of qualitative researchers perceive that reality is not objective but is socially constructed, like for instance Berger and Luckmann (1966), who view knowledge as grounded in social existence. Peoples' ideas and values change as society changes. Realities of specific groups are objectified in symbols such as art, language and communication. Groups have different ideas and meanings which are context specific. There is a reality of everyday life that is the common sense which society shares. However, this everyday life varies for groups of people. Peoples' capability to use language is a key human characteristic where language is central to sensemaking and organisational learning (Weick *et al*., 2005).

Qualitative research involves the use of qualitative data obtained during interviews, by using documents, and observation of participants by the researcher. This is done to understand and describe social phenomena. This can be applied in many domains and using a variety of approaches, methods and techniques. Myers (2014) stated that in "*Information Systems we study the managerial and organizational issues associated with innovations in information and communications technology (ICT), hence the interest in the application of qualitative research methods.*"

The incentive for doing qualitative research, as opposed to quantitative research, arises from the observation that the one aspect which distinguishes humans from other species is the ability to talk. Qualitative research methods help researchers to understand people and the social and cultural contexts within which they work and live. Social and environmental context is lost when attempting to quantify data. Merriam (1998) states that the key philosophical assumption of qualitative work is that reality are constructed by individuals that are interacting in their social worlds. Researchers studying this are interested to understand the meaning that humans have assembled. Berger and Luckmann (1967) described the perspective of social reality and interaction of humans – a social constructivist's view in their book – "*The social construction of reality*".

Methods in qualitative work should be chosen and used as needed an as appropriate for the situation e.g. to explore people's life histories or experiences. The qualitative method is appropriate in this study where experiences of IS stakeholders are investigated. Narrative analysis is often used in qualitative studies where the experiences of people are offered as stories (Silverman, 2013). The aim is to understand and take context into account. This correlates with the work of Weick (1995) on sensemaking and Clandinin and Connelly (2000) in narrative inquiry.

Narrative research differs from its positivistic counterpart in the underlying assumptions that there is not a single, absolute truth in human reality. There is also not one correct reading or interpretation of a piece of text. Narrative approaches advocate pluralism, subjectivity and relativism. However, the researcher should be responsible to choose appropriate research methods and processes and justify their use (Lieblich *et al*., 1998).

Narrative research refers to "*any study that uses or analyses narrative materials*" (Lieblich *et al*., 1998). The data collection can be a story via an interview or a literary work or field notes as part as observation or conversational notes. Narrative studies work well as a means of understanding personal identity, lifestyle, culture, history and this can be in different fields of study such as education, law, history and psychology.

Herman (2009) reflects on the interdisciplinary perspective of narrative theory. There was a narrative turn where multiple fields of inquiry unfolded over decades. It is widely recognised within the narrative domain that cross disciplinary work is conducted within the narrative field and narrative methods also developed and changed over the years (Hyvärinen, Kreiswirth, Barthes in Herman, 2009). This raises the question of a potential eclectic view and application.

3.1.2 Eclecticism

Silverman (2004) refers to narrative integration where the material of the fieldwork of researchers is used in a narrative way. This narrative approach is influenced by psycho-analysis and researchers used fieldwork notes in a retrospective way reflecting on the process of conducting the research project. Miller and Fox (2004) described the analytical potential of qualitative work and how bridges may be built between several approaches to social life. In this way the strengths of each approach are utilized while the distinctiveness of each approach does not fade.

Two or more disciplines can be linked and are used in a mutual informative ways, but each discipline's contributions and characteristics are respected and the integrity of each perspective is valued. In this way eclecticism does not need to be an issue between disciplines. Eclectic practices are used in many disciplines such as philosophy and psychology. Indeed there are appeals made from both of the disciplines involved in this study to share and transport methods and application areas between disciplines -see section 2.3.3 (Bignell & Fortune, 1998; Fortune & Peters, 2005; Lyytinen & Hirschheim, 1987; Young, 2005; Boje, 2011; Clandinin & Connelly, 2000; Clandinin, 2007; Mishler, 1991). According to Coscollá *et al.* (2006) eclecticism is imbued in postmodernism. There is scepticism of grand narratives and the truth is seen as relative – this is in the field of psychotherapy. Eclectic views are that "*everything goes*" and "*let's apply what works*". There are many perspectives and voices. These views are also shared in the narrative inquiry domain (Clandinin & Connelly, 2000). The many voices and

perspectives are also inherent in the IS failure phenomenon and in this way the eclectic view is communal.

According to Johnson and Onwuegbuzie (2012) mixed methods research is "*where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study* ". They refer to this as a third research paradigm in education research. This view on eclecticism where mixed or pluralistic methods are used, often combines qualitative and quantitative methods in one study. This is however not applied in this study. In this qualitative study methods from the social sciences were borrowed and applied within IS. The study is interdisciplinary - but the methods used are not from many paradigms. However, the following description from Johnson and Onwuegbuzie (2012) is true in this study: "*Mixed methods research also attempts to legitimate the use of multiple approaches in answering research questions rather than restricting researchers' choices...*". Morse (in Creswell, 2006) refers to multimethod research where more methods are used but research approaches and paradigms (e.g. qualitative and quantitative methods) are not mixed. In this study three narrative analysis approaches were applied in order to get a more comprehensive view of each participant's experience of IS failure. Boaz and Ashby (2003) discuss the criteria "*fitness for purpose*" to indicate that the methods used should fit the aim of the research. In this study the use of narrative analysis methods fit the aim of the research - to make sense from the users' experiences of IS and understand more about IS failures. The application of these three narrative analysis methods provides the opportunity to investigate through a multi-lens the accounts of the stakeholders and the research methods are fit for this purpose. The three analysis approaches are practical in the process of getting insight in the multiplicity of voices and understanding the different perspectives of IS stakeholders.

Clarke and Lehaney (2000) edited a book on information systems research methods and practices with the focus on human centred methods. All the contributions in the book discussed social, technological and people issues within IS – the practice and theory. This is indicative of the strong relationship between organisational issues, human activity and technology.

When IS are planned and developed the concept of stakeholders is fundamental because they are the primary source for requirements in a project. They are affected and can affect business activities. They all may have unique views of the system in question. Ballejos *et al*. (2008) emphasise that the stakeholders should be modelled and integrated into the system requirements and implementation model. In this way more success will be achieved in systems.

Previously, computing was seen together with engineering sciences and with the hard systems' view. A system can be described as a hierarchy of components and be modelled as input, output, transformational and control mechanisms. Very often complex systems were described in such a way. This was useful to a certain extend but the critique was that people are not taken into account. It has been recognised for a long time that technical solutions alone cannot be imposed without considering people and the affect systems have on people. (Kirk, 1995). Consequently, the methodology of soft systems thinking was developed acknowledging certain characteristics.

- Qualitative rather than quantitative objects;
- No single solution exits, but rather a range of equally valid solutions;
- A need for everyone that is involved to be part of the process;
- World views are taken into account in any situation.

It is thus seen why it is necessary for all stakeholders to be involved to facilitate and implement an agreed solution.

Checkland (1981) stated that a reason for failures in systems in the past could be as a result if the reductionistic view that was held previously. Later Winograd and Flores (1986) also challenged the scientific method in the field of artificial intelligence. These challenges and critique to the scientific method lead to greater acceptance of alternative methods and practice - such as systems thinking and interpretive work (Stowell, 2009). The problems of understanding the complex and "*messy*" situations led to incorporation of worldview and ideas of how we make sense of the world around us. Systems were not out there that need discovery; but the view became that the world is complex and it seems different for each actor involved. Systems thinking are aligned sociologically to interpretivism and constructivism. Understanding can only happen from the experiences of the actors over time (Stowell, 2009). As seen the discussion above and when studying recent IS research outputs (Dalcher, 2009; Drevin & Dalcher, 2011; Fincham, 2002; Lagsten, 2011; Voinov & Bousquet, 2010) it is indicated that the field of information systems hinge much closer to social ways of thinking. Kreps and Richardson (2007) report on IS failure, and how social and technical factors combine and contribute to project obstacles. They analysed IS failures and then highlighted the importance of the view that systems are socially as well as technically constructed. Systems are complex and often include many groups, cultures and stakeholders. Software process improvement and information system development must not only be a technical activity but should be understood from a wide social and organisational context and encompass organisational culture and participation of all stakeholders (Baker, 2011). Suboptimal information systems may be a result of using rigid methods in dynamic organisational environments. By integrating social and technological considerations a more successful system can be built (Baker, 2011). Sensemaking is embedded in the soft system methodology approach that is widely used for system development (Weick, in Baker, 2011).

Even though the traditional view of Computer science is seen as reductionistic where all problems are reduced to models and programs, it has been acknowledged for many years that technology alone cannot solve problems where humans are concerned (Lucas, 1975). Therefore the shift towards Information Systems (where this work resides) indicates that the human and social component and context is of utmost importance alongside the technology. See definition of IS and IT in section 1.9 (Bentley & Whitten, 2007; Shelly *et al*. 2006). The question of whether IS and narrative methods which originate in the social science are incompatible seems to fade in the light of the above discussion. IS methods do indeed take into account people, organizations and their needs and requirements when designing and developing an IS (Myers, 1997; Myers, 2014). It is shown throughout this thesis how narrative inquiry can be of benefit in this process – see section 7.4 on contributions, as both fields can be both supporting and enriching for the other.

The above discussions presented views on eclecticism and it is shown that a multimethod approach was applied in this study. Views of Computer Science as a hard science and Information Systems, where human and social aspects are incorporated were also discussed. It is seen that research and operational methods can be borrowed from other sciences and disciplines, evolve over time, and enrich others in terms of research methods, as well as on a practical level. What stands out as significant is that methods chosen should fit and be acceptable to support the aim and research questions of a study. In this qualitative study it was possible to use three narrative approaches in a practical way to analyse the accounts of the IS stakeholders in order to be able to get the multiple perspectives on the phenomenon under investigation – IS failures.

The next section presents the roadmap that was followed for this study.

3.2 Aspects in research – a roadmap for this study

This study was interdisciplinary and involved two main fields namely information systems (specifically IS failures) and narrative theory. These two domains had to be investigated for appropriate research methods to guide the study. It was however natural to start with the better known area for the researcher, namely information systems as this is where she resides. A roadmap for IS was chosen to guide this research process. However, the narrative field and its methods were influential in making and shaping decisions towards which approaches to employ in this study in order to analyse and interpret the data. The roadmap that has determined the flow of the research process is discussed next.

To conduct research is to create new knowledge to the satisfaction of the users of the research, by making use of an appropriate process (Oates, 2006). Aspects of research that need consideration in a study are as follows:

1. A paradigm or shared way of doing research provides the underlying philosophy (Section 3.2.1).
2. There is a process to be followed (Section 3.2.2).
3. Every research project should have a purpose (3.2.3).
4. The outcomes of research have products, e.g. contribution to the discipline (Section 3.2.4).
5. There are participants (Section 3.2.5).
6. The results of the research must be presented in some way such as a publication or an oral report (Section 3.2.6).

The above six points will first be discussed for research in general and thereafter as it pertains to this study.

3.2.1 Paradigms

All research is based on the underlying assumptions (sometimes hidden) of the researcher which are often embedded in a particular paradigm. The paradigms of positivism, interpretivism and critical research are briefly evaluated for appropriateness for this study.

Positivism

This paradigm is the oldest of the three paradigms mentioned above and it is often called the scientific method or scientific research (Oates, 2006; Saunders *et al.*, 2003). Some people refer to this method as the only 'proper' method of doing research. The scientific method relies on two basic assumptions, viz.:

The world we are studying is ordered and regular, and therefore:
It is possible to investigate the world in an objective way.

Positivism is suitable for a study of the natural world, but the social world, (people, organisations and cultures) cannot successfully be researched by the scientific (positivistic) method.

In the light of the above we can conclude that the nature of this study is not positivistic as the data and the analysis thereof will not fit in with this particular philosophical stance. Narratives – rich in contexts and meaning - cannot be reduced to numbers and statistics. Alternative research paradigms have been developed since the late 19th century to study people and their worlds. These paradigms are described next.

Interpretivism

Interpretivism is seen as an alternative research paradigm. There is no hypothesis that needs to be confirmed or rejected. The research is led by research questions. Interpretative studies in IS and Computing are concerned with the understanding of the social context in which an IS operates (Oates, 2006:292). This paradigm promotes the following:

> Identifying, exploring and explaining all the related factors in a specific social setting. Phenomena are studied and understood through meanings and values of people and how they perceive their world. The aim is to create a rich understanding of a context and what follows is an organised discovery of how humans make sense of their world. Changes in perception over time are possible and individuals and groups can differ. The role of the researcher is to understand the subjective reality of the study participants and make sense from their motives and actions.

Often the researcher working in this paradigm is faced with the quality of interpretivistic studies and how it is judged and reviewed by others. Oates (2006:293) argues that the quality criteria for positivist research are not appropriate for interpretive work:

- Objectivity cannot be viewed the same in interpretivistic studies as in positivistic work, as the researcher interacts with and has an effect on the people being studied.
- Reliability in the sense of repeatability of the experiments to get the same result cannot be obtained here. The social constructions by individuals that are studied change over time and another researcher will not necessarily obtain the same results.
- Internal validity: there is no ultimate benchmark against which to test the findings. There are multiple constructed realities when engaging in interpretative studies. External validity, which implies generalisation, is less likely in interpretative studies because the contexts and individuals' constructions are unique.

Lincoln and Guba (in Oates, 2006:294) propose alternative yet similar criteria as for positivistic research to judge the quality for interpretivism. The following terms are used:

- Trustworthiness relates to validity. How much trust can we place in the research?
- Conformability relates to objectivity. Can the research findings easily be deducted from the data, analysis and experiences?
- Dependability relates to reliability. Is the research process and data well documented?
- Credibility relates to internal validity. Are the study subjects well identified and described so that credibility of findings can be achieved?
- Transferability relates to external validity. The researcher should give a thorough description of the study in order for other researchers to compare their situations. Can findings be used in other studies?

What is important is that the research process should be well documented and that the data should be accessible to convince others of the trustworthiness of the study. This refers to the plausibility of the process and results of qualitative research.

Research being done in this paradigm focuses on the complexity of human sense making. The phenomenon is understood through the meaning that people assign to the specific subject under investigation. It is necessary to understand the context of the IS as well as the process whereby an IS influences, and is influenced by the context. Narrative approaches fall into this paradigm. For this work the researcher studied the narrative theory field in order to establish the possible linking of IS failure and the investigation thereof by means of narrative analysis methods. It was seen from the literature that narrative was appropriate for studying and understanding experiences of people. Clandinin and Connelly (2000) apply narrative inquiry in the educational environment. Narrative is central for them in order to understand people and their experiences. Their work builds on the work of John Dewey where experience is the key term, in order to understand educational life. At the 20th anniversary of a narrative oriented conference in Philadelphia, Elsmore (2011) focused in his presentation on the work of Dewey pertaining to teaching, comparing aspects of Dewey's work with that of Boje – a contemporary narrative scholar. This also indicates the link between experience and storytelling. In this study the experiences of IS user groups need to be understood in order to make sense from their work life and to learn lessons for the future. Clandinin and Connelly (2000) state that

> *"experience happens narratively".*

This phrase was guiding the narrative work done in this study.

We can deduct from the above discussions that the interpretive philosophical stance fits the nature of the research proposed for this study. Peoples' perceptions on IS failure and their recounting of the events need to be taken into account. Every participant may have an own account of what went wrong and the researcher has to listen to as many stakeholders who were involved as possible, or necessary, and try to interpret what was said and what was actually meant.

There is however another paradigm, that of critical research, that is perhaps less well known but also relevant as a philosophical paradigm in computing and IS.

Critical research

According to Myers (1997) critical research is concerned with oppositions, conflicts and contradictions in society and it seeks to emancipate and free subjects. People must be empowered to eliminate causes of alienation and domination. Thus, oppressive structures must be changed. The interpretive view is to understand and describe phenomena but the critical researcher wants more. Although they agree that social reality is created and re-created by people, they also say that social reality possesses objective properties such as political and cultural systems that dominate our experiences and world views. The focus is on power in relations and the conditions of domination must be identified and challenged. Positive changes must be made to oppressive situations. Jürgen Habermas was an influential figure in the development of the critical research philosophy.

From a critical research viewpoint it can be seen from the above discussion that it is important to understand the environment. Even more important is the changing of oppressive structures through empowerment and intervention. For this study it is not the main aim to emancipate oppressed parties. The aspect of understanding the environment, in which the phenomenon exists, is the most important. However, changes may and will occur as a result of improved practices.

The choice of paradigm will depend on the nature of the research questions, personal beliefs and values of the researcher and typical research of the discipline. All three paradigms discussed above are used in the Information Systems and Computing fields.

To conclude the research paradigm evaluation we can restate the purpose of this study: to import research methods from the social sciences and apply narrative analysis approaches to the stories of information systems stakeholders in order to make sense from their experiences of IS failure. This work intends to understand their experiences and contexts; therefore the interpretive stance is utilised as the foundation. Qualitative accounts of the stakeholders' experiences are used, analysed and interpreted to get insight into the real problems they encounter or face at times.

3.2.2 Process

Some thoughts on the research process to be followed in general are highlighted in this section. Thereafter the specific process for this study will be elaborated upon. According to Knox (2004) the impact of philosophy on the research process should be critically analysed, especially at doctoral level. Figure 3.1 shows a diagram of the research process as discussed by Saunders et al. (2003). Collingridge and Gantt (2008) refer to a coherent qualitative framework to be followed in order to ascertain the validity and quality of qualitative research. In this light the research onion of Saunders *et al*. (2003) was used in this study as well as the roadmap of Oates (2006).

In Figure 3.1 the positivistic philosophic stance of a researcher and the phenomenology (understanding and interpreting of a unique environment) are situated at two ends of the outer layer. The research approaches of deduction and induction as shown in the next layer are linked to the underlying research philosophy. Knox also refers to Ticehurst and Veal (2000) who use the terms quantitative and qualitative research in these two opposite positions (positivistic and interpretive). The viewpoint of this author, however, is that these opposite positions can make it difficult for researchers to choose the most appropriate research

methods (strategies, data gathering and analysis methods) as they try to follow their research philosophy and research methods in a prescribed way. Methods should also be dependent on the research questions of the project and not purely on the philosophic stance of the researcher. Knox (2004) states that a researcher should not naively link methods and approaches and thereby miss out on creative data collection methods. Denzin and Lincoln (2003) also support this idea that the researcher may use whatever strategy is at hand and new tools may even be invented. The research questions in their context, give rise to the research practices utilised in a research project.

Research strategies that were evaluated for this study are as follows (Duncker, 2003; Myers, 1997; Oates, 2006; Saunders *et al.*, 2003):

- Experiments: This is mostly the choice in positivism for the scientific method. Experiments are planned and developed to test hypotheses. Objectivity must be adhered to and researchers do not influence the outcome. Mainly quantitative data are generated and analysed. Experiments can be repeated and the aim is to generalise. This strategy was therefore not suitable when looking at the experiences of IS users that cannot be fitted into experiments.

- Surveys: This strategy is often used in positivistic research. Surveys look for patterns in the world and the researchers have certain assumptions thereof. Careful sampling is carried out and the data is of quantitative nature and is statistically analysed. This strategy was ruled out as a research method for this study.

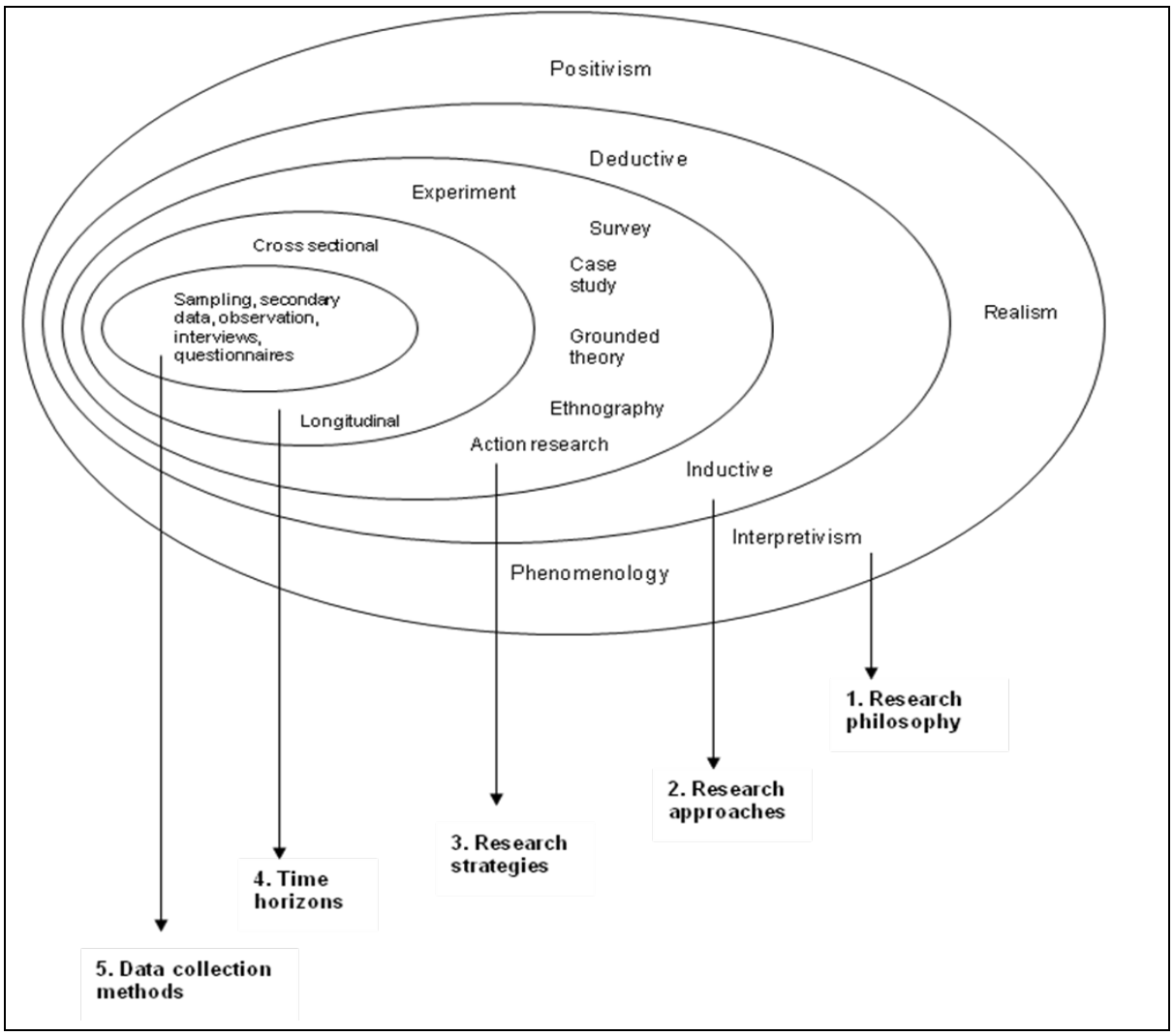

Figure 3.1 Research process onion (Adopted from Saunders et al., 2003)

- Ethnography: This strategy is associated with interpretivism. The researchers aim to understand the people in their worlds and it is recognised that the researcher will influence the situation under study during the project which may have a long duration. The work can also be done from the critical viewpoint when politics and power centres are in focus. This strategy was not chosen as the research objective was not to emancipate the IS users.

- Case studies: These are often associated with interpretivism. Case studies provide insight into a social setting which can be unique to that situation. Researchers examine the way in which people and groups perceive their world and multiple interpretations are given. The researchers acknowledge their influence on the situation and interpretation. Critical research can however also be done with case studies where power structures and hidden agendas are studied. Case study research can also be positivistic when theories are refuted or confirmed by carefully choosing the case to be typical of a wider population. This strategy was suitable for this study in that insight in the study area was required and gained. The term 'case history' was rather used as the failure situations happened in the past and investigations took place after the events (Dalcher, 2004).

- Action research: This strategy can be used in any of the three paradigms. When working interpretively the action researcher works with people in a social setting to discover how they perceive their world. When working critically the aim is not only to understand the setting but also to facilitate change. Action research can also be done in a positivistic way to test theories by using control groups. This strategy was not chosen because the researcher did not facilitate and bring change as a main aim. This could however be a side effect of the study.

- Design and creation: Often designers focus on the technical aspects of an IT artefact and do not think about the philosophical foundation. Often the positivistic viewpoint is taken when a computer system is seen as a means to an end. The designer is objective and produces models that represent reality. However, methods that focus on interpretations of all the stakeholders in a situation such as Checkland's Soft systems thinking (SSM) are in the interpretive paradigm (Checkland, 1981; Checkland & Scholes, 1990). Designers work with the users to develop artefacts that are better understood. Critical researchers feel that it is not possible to serve both the managers' and workers' interests. Designers seek to develop IT artefacts that assist the less powerful people in the social structure to overcome barriers. This strategy was not suitable in that no design was done.

Each of these strategies or research practices has certain data gathering methods. The following data generation methods were evaluated for this study (Oates, 2006; Saunders *et al*., 2003; Weaver, 2004):

- Interviews: This consists of conversations between people that can be one-to-one or group interviews. The researcher will normally have a set of questions or guidelines to guide the interview. This method was mainly used in this study.

- Observation: In order to get good insight into a situation, for example how people do things, the researcher can watch them or use other senses for observation. This method was not used as the IS incidents already happened and could not be replayed.

- Questionnaires: This entails a predefined set of questions related to the phenomenon that must be studied. Respondents answer the questions and the data obtained need to be analysed. As this phenomenon needs to be understood comprehensively a questionnaire with fixed questions was not suitable.

- Documents: Documents that existed prior to the research or documents generated for the research are studied to obtain data about a situation. No documents could be obtained as confidentiality would be compromised.

Data obtained by these methods can either be qualitative or quantitative and must be analysed by appropriate methods. Quantitative data is normally analysed by using statistical methods and computer packages help in this regard. Qualitative data must be interpreted using other methods including theme analysis, narrative analysis, discourse analysis, grounded theory, etc. For this study narrative analysis was done drawing from the work of Clandinin and

Connelly (2000) where experiences of people in relation to their contexts and time spaces (temporally) are the topic of their approaches.

In order to show what have been used as research approaches in information systems the following discussion is given.

Research used in Computing and Information Systems

A variety of research approaches have been applied for decades in order to understand how people use information systems. Each paradigm has underlying assumptions, strategies and methods. People assess the quality of research outcomes from the viewpoints of the different underlying paradigms.

Positivism was predominantly used until a few years ago. Since 1991 interpretive research has been increasingly accepted in IS journals and at conferences (Lee, 1999).

Lee (1999:9) identifies four interrelated dimensions of management information systems (MIS) in a chapter of a book called 'Rethinking MIS':

1. MIS involves not only information technology, but also the instantiations thereof.
2. The information system and the organisational context must be studied and understood.
3. MIS involves IT as a form of intellectual technology.
4. MIS involves activities of a profession or a corporate function.

These dimensions show that IS research is moving beyond the domains traditionally researched in computer science and related fields. Lee also explains that the positivistic paradigm is not suited to study all of the four dimensions of IS as stated above. For example: positivism is well suited to study IT itself (dimension 1). However, the rich aspects of human and organisational instantiations of IT will not be fully understood and described in this paradigm. Therefore the interpretive paradigm can be used, although the question of what should be done or what should be changed is still not answered. Other avenues of researching IS should be taken in future. Lee (1999) refers to specific research strategies such as action research. Walsham (2005) gives guidance on how interpretive case studies can be used as a research strategy. Philosophical and theoretical issues are discussed to stimulate further reflection and contribution to IS research. Klein and Myers (1999) also reflect on the appropriateness of interpretive research and its potential to produce deep understanding into IS phenomena. Walsham (2005) also argues that we (IS researchers) should use theories from other disciplines *"in order to better understand our domain of interest".*

In this study the viewpoint is held that paradigms are not at opposite ends, but are used as appropriate for the research questions and research environments. Strategies are therefore utilised as necessary and even new approaches are developed as argued by Niehaves and Stahl (2006), Young (2005) and Denzin and Lincoln (2003). It is not only the IS research field that necessitated new research methods but also the narrative field. Polkinghorne and Czarniawska (in Clandinin & Connelly, 2000) both bring narrative to their fields and utilize it to bridge research with practice.

3.2.2.1 Research process for this study

In the above discussion certain issues have been presented concerning the research process. This section takes the process together for the study.

A literature review on the topic of IS failures and problems was done to determine the definitions of failure and success, to give examples of such incidents and to list factors contributing to failure or success. Current methods to investigate failures were studied to conclude how successful they have been. This gave insight to other approaches for investigating failures as current methods have not been very successful. Literature on narrative methods (as a second main area) was studied to ascertain their feasibility when applying them to IS failure situations. Narrative approaches were studied and compared, reviewing the literature critically. Where are narratives used? How are they applied? The work of Clandinin and Connelly (2000) was instrumental in designing the interview schedule. They propose a three-dimensional narrative inquiry space where the interaction, temporal and situational aspects are being studied. This study further adopted and applied the views of Boje (2001) who stretched the traditional narrative approaches to use antenarrative methods to open up avenues for the researcher where stories are not linear with beginning, middle and end. Antenarrative includes fragmented, nonlinear and multi-perspective stories. From his work three broad methods were proposed for conducting narrative analysis in this study. The approaches are comparative by nature and the researcher works as if having a multi-lens on the data in order to understand the phenomenon more comprehensively.

The researcher has attended conferences, visited and spoken to a few experts in the narrative field – nationally as well as internationally to gain more insight into this domain. This was necessary to learn firsthand from experts and not only rely on literature reviews. Duquenoy (2001) quoted Lessig (1999) as to illustrate the new area of cyberspace, but for this author it can apply to this study as well. *"This is not a field where one learns by living in libraries. I have learned everything I know from conversations I have had, or watched, with an extraordinary community of academics and activists, who have been struggling over the last five years both to understand what cyberspace is and to make it better."*

A pilot study was conducted where stakeholders in group IS projects were interviewed to test the interview process and methods e.g. recordings. The interviews were analysed to obtain insight into what can be gained from the responses.

Next, a case history regarding IS failure situations was investigated. A specific case was identified to be studied in this research using the three parallel approaches. It is based on a currently operational system in an academic environment about which users express problems and frustrations from time to time. An initial interview was conducted and analysed to confirm the interview schedule and methods. Thereafter interviews were held with different levels of participants to obtain their stories regarding their experiences. All level of role-players were included in the study. These recordings were transcribed and analysed using three specific narrative approaches outlined earlier. Each narrative approach was applied to every interview transcription completing one approach for all the accounts first. Thereafter the next approach was used. In between analyses a few more interviews were held until saturation of data was obtained. Often the researcher had to go back to listen to the original recording of the account

to make sure what was said or implied. Notes were made by the researcher, issues highlighted, lists of themes were constructed using spread-sheets to do mapping of specific issues and between stakeholders. Lines were drawn between different stakeholders' accounts and perceptions. The specific narrative elements as indicated in table 2.5 where the initial framework of the three methods is presented was instrumental in the analyses of the accounts. Issues were grouped into topics and categories per specific groups. There were almost 10.5 hours of recordings that had to be transcribed and analysed – this resulted in more than 200 pages of text (Table 3.1).

Profile of data			
Stakeholder	**Length of recording hours:minutes**	**File Size (MB)**	**Pages**
1	01:01:12	22.6	27
2	00:55:34	20.4	22
3	00:34:33	12.5	14
4	01:34:01	54	39
5	00:27:20	9.9	12
6	01:33:45	34.5	35
7	00:33:45	12.1	13
8	01:01:02	22.6	20
9	00:54:10	20	23
10	01:05:30	24	30
11	00:47:32	17.3	11
Total	**10:28:24**	**249.9**	**246**

Table 3.1 Profile of data

The researcher evaluated and reflected upon the usefulness of narrative methods when studying IS user groups and their accounts of incidents. From all the analyses and literature a multi-perspective framework for analysing stakeholders' accounts was developed. Numerous lists and tables of issues and elements that emerged from the accounts were constructed during the study. Summaries and interpretations thereof are shown in the rest of this document and summarized in chapter 7. The iterative analysing of the accounts, applying the three lenses, gave the researcher information regarding the usefulness of the imported narrative methods.

Conference presentations and publications by the researcher were also utilised as a vehicle to ascertain the value and impact of this work for both disciplines. Final conclusions have been derived and documented in this thesis.

The next aspect of research from Oates (2006) as discussed in section 3.2 as a roadmap for this study is that every research project should have a purpose.

3.2.3 Purpose

There should be a reason that a specific study is undertaken. Therefore the reasons for doing research are stated as the purpose. These may include solving problems, adding to the body of knowledge, developing greater understanding of people, to test or disprove a theory etc. (Oates, 2006).

This study aims to import methods from another domain (narrative theory) and apply it within the IS field. This is done in order to better understand problems within IS systems thereby improving the IS practice as well as adding to the narrative theory field. We want to solve problems presently not being fully addressed by current methods.

3.2.4 Contribution

The next aspect of the research roadmap is the contribution. Different possible outcomes of research can be achieved: a new theory or improved product, new or improved tools or techniques, an in-depth study of a situation, a critical analysis etc. It is also possible that two researchers working from the same research questions may produce different outcomes.

In this interdisciplinary study research approaches were borrowed from another field thereby expanding the IS research methods. The IS development practice benefits from this study in that new approaches are used and applied in order to make sense from IS failures. The narrative theory discipline is also enriched in the sense that new domains are investigated and brought into their field. As Clandinin and Connelly (2000) put it "*Our hope is that the book offers imaginative possibilities for other narrative inquirers to continue to work at the boundaries, to stretch themselves in new ways as they try to come closer to understanding experience."* More elaboration on the contributions is given in chapter 7 and 8.

3.2.5 Participants

It is important to reflect about the participants in any research study undertaken. Who will be involved, how will they contribute and what are their rights. The role of the researcher should also be well thought about.

Role of the researcher

In this study - the researcher has explored the domains of IS failures and narrative theory – two seemingly unrelated fields. However it is shown in this work that new insights are gained into IS failures by importing methods from elsewhere. In conducting the study the role of the researcher is as follows:

The researcher is the inquirer and interacts with the narrators, those who were affected by or who influenced the outcome of an information system. Morse *et al.* (2002) stress the importance of verification strategies to be used by the researcher. In order to attain reliability and validity in the process of inquiry the following strategies can be used. It is also shown how the researcher had to adhere to these guidelines:

- Investigator responsiveness. The researcher must remain open to receive information and be sensitive to possible changes during the research process. In this study the

structure of the interview was open to be able to incorporate every participant's views and roles.

- Methodological coherence. The research questions and the methods used should match. Methods may be influenced by the data as the research process unfolds. It was seen in this study that new narrative methods had to be employed. The initial analysis methods in this study were not sufficient for data analysis and the full understanding of the IS failure phenomenon. Post-classical approaches were also applied in this study.

- Sample adequacy. The participants should be chosen with care to best represent the area under investigation. Sufficient data to cover the important aspects of the phenomenon under investigation must be gathered from the participants. Different users groups using this system on all levels were included as part of this study. In this way, all levels were represented and could be included to let their voices be heard.

- The gathering of data and the analysis thereof should be done concurrently. There is interaction between data collection and analysis and this process is iterative. This approach was applied in this research.

- Thinking theoretically implies that ideas emerging from the data must be reconfirmed by new data. Theory can develop as an outcome of the research process or as a comparison template for further theory development. Subsequent interview data confirmed the previous interpretations of stakeholders' accounts in this study.

All the above strategies help to ensure rigour and build reliability and validity in a qualitative study.

From the above discussion it can be said in summary that the researcher should be proactive and be responsible for the rigour during the research process. Reflection should not only be done on the completed work, but during the research process itself.

For this study the above guidelines were taken into account while working with the participants, documenting the process and concluding the research results.

Participants and the case environment

This IS had problems and certain users have expressed their discontentment regarding their use of the system. This fact made the investigation of this system relevant where failure was to be studied. Initial meetings were held with the management of the IT division where the particular IS applications are used and operated. This was necessary to get permission to proceed with this project. This was also done to establish the different participants in this IS. Consent was granted to proceed with this project and confidentiality of data and participants had to be ensured. Interviews were scheduled with different participants to include users on all levels of operations in order to get diverse accounts of their experiences. Some of these participants were older, some younger, some were newer to the environment, some more experienced. The organisation where the complex IS was investigated is an academic institution. There are three campuses spread over a few hundred kilometres from each other

geographically. The system consisted of about 19 subsystems which are used by different stakeholder groups. The divisions involved are from all the campuses as well as an outside company that handle most parts of the development and enhancement of the system. Internally there are groups such as:

- Users on ground level, e.g. secretaries and other personnel responsible for student records, grades, financials etc.
- The Main User who handles queries and errors from the normal users.
- Super Users who take care of internal queries from the main user and either handle it themselves or escalate it to the IT department or to the external company.
- Information technology (IT) staff which handle the reported problems themselves or give it over to the external company (EC). The external company also involved a company abroad when mayor changes and upgrading to the system were necessary.

Externally an outside company (EC) is responsible for new systems development and new functionalities and maintenance. During this particular system deployment a company from a foreign country was also involved and specifically converting the current programming code to Java (AC – abroad company).

Figure 3.2 indicates the levels and stakeholder groups involved in the specific IS and how they communicate with each other.

A total of 11 formal, in depth, semi-structured interviews were held with stakeholders. These were:

- 2 participants from the outside or external company (EC)
- 2 participants from the Information technology division (IT)
- 1 Main User (MU) who will be grouped with the next group
- 4 Super Users (SU)
- 2 Users on ground level (U)

Numerous informal discussions were also held with users on different levels on the usage and operation of the specific IS under discussion.

The main method of data gathering was to interview the participants. The next section discusses aspects of interviewing that the researcher needed to take into account for this study.

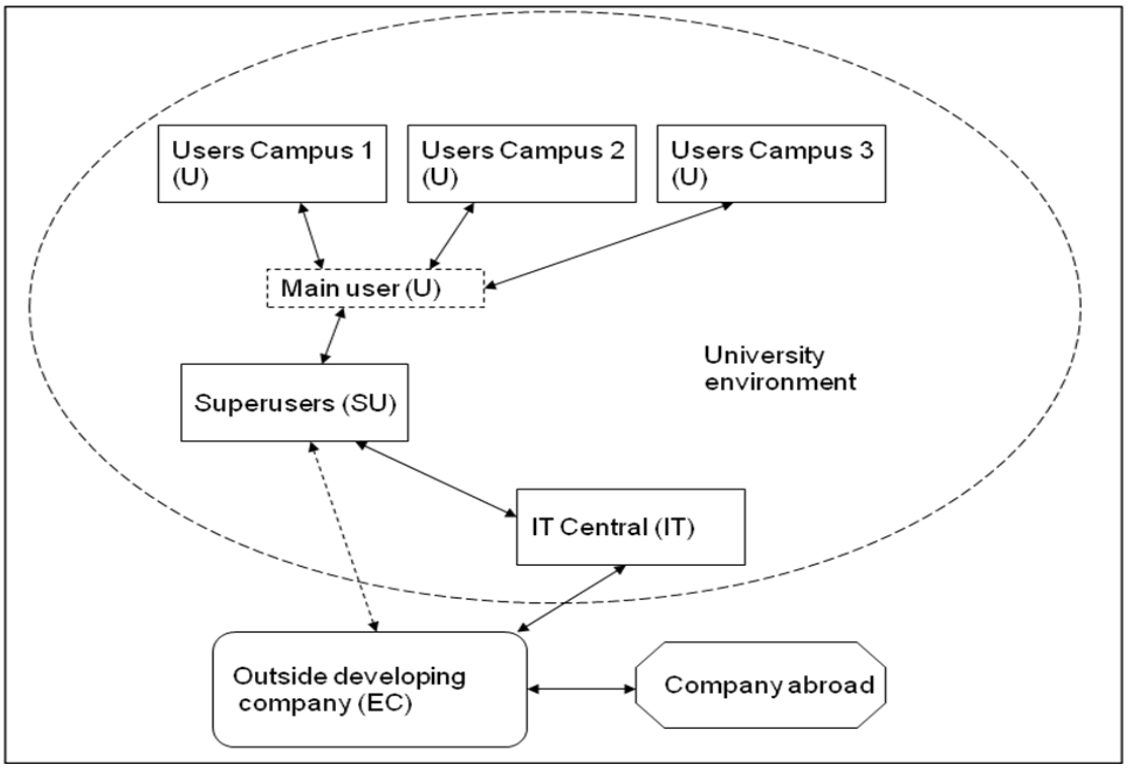

Figure 3.2 Stakeholder groups (own construction)

Interviews

An interview, according to Gillham (2000), is usually a conversation between two people. The interviewer seeks responses for a specific purpose from the interviewee. The interviewee may benefit from the interview such as the case of a doctor patient interview, but in the example of a market researcher there is no benefit for the interviewee. The purpose of the interview determines its form and structure. Wengraf (2001) refers to a research interview and states that it is a special kind of conversational interaction. It must be planned and prepared for and the interview is a joint production by both interviewer and interviewee and the information obtained will be used to go into more depth of the situation being studied. The aim is to get more detailed knowledge of the situation under discussion and to make sure that deeper understanding is gained of the little that is known on the surface. Padgett (2004) confirms the idea that in depth interviewing is a mode of data collecting but, remarks that interviews alone are not enough. Other observational data and /or the use of documents give more substance and texture to the data.

Holstein and Gubrium (1995:1) state that the interview reveals much about life. Researchers from many domains get their information by means of interviews. Interviews are interactional events and asking people to talk about their lives or incidents or findings generates a massive amount of data. The term interview was not used much until the time of a study of Mayhew, during 1861-1862 (Ibid.). This work concerned poor people living and working in London. Until then there was the idea that some respondents (interviewees) are narratively incompetent because they are poor, or too young, or of the wrong gender, or that the population is not worthy of the researcher's attention. The 'active' interview is described by Holstein and

Gubrium (Ibid.) and they argue that if people were to be left out of interviews their voices and the 'whats' of their lives and experiences will not be heard in the data gathered by interviews.

Interviews aim to incite narrative production and therefore the method used to select respondents is important. Willis (in Holstein & Gubrium, 1995) highlights the idea of selecting interview respondents to represent an orientation of people as well as a sample of a population. This tries to maintain people representation and sample representativeness. These actions contribute to the validity and reliability of the study.

The respondents must be capable of narrative production. The interviewer does not uncork a vessel to get to the repository of answers. The respondent is a storyteller and relates experience at a time and place. The narrative he/she is giving combines experience, emotion and expectation and tries to connect disparate parts into a whole that is meaningful. However, the storyteller also reacts to the audience and the interviewer and therefore comments, prompts and questions can be used to steer the respondents to specific topics. The active view of interviewing lets both parties be interpretive in their actions. The interviewer as well as the respondent may ask questions. The interviewees are not tightly anchored to an interview schedule; they are narrators of their lives or experiences (Holstein & Gubrium, 1995). The term narrative represents an account of something that has happened.

An expert researcher will always have a structure but it can be used flexibly as the interview progresses.

The above discussion of what interviews are and the different ways they can be used show that the interviews used in this study, where the richness of individual perspectives have to be accumulated, had to be loosely structured in order to promote the production of a narrative describing failure situations in depth. The researcher had to be flexible but well prepared to gain insight into the incident under investigation. Notes were made during the interviews. Comments were generated by the researcher as analyses of the account were done. Chapters 4 – 6 present representative quotes of stakeholders to give evidence of interpretations made.

The interviews were part of the research strategy of a case history situation where the stakeholders shared their experiences of IS failure situations with the researcher. Trust was established in this process and the stakeholders appreciated it to be able to share. In this situation the researcher could also think about own experiences with the IS in question.

The interview framework or schedule that was used for this study to get insight into the experiences of the IS stakeholders is presented in list 3.1. They were invited to share what they would like to talk about of the IS in question taking the given guidelines into consideration.

Introduction

- Background, confidentiality confirmation, etc.
- I am interested in your stories and experiences regarding this IS. (System ABC – and the subsystems you are using)

A) <u>(Personal and social dimension)</u>

- Give your perception on the development and use of this IS
- Your role
- Interaction with other role-players
- Political issues
- …

Specific issues:

- Problems
- Failure
- Success
- …

B) <u>Time/continuity - dimension</u>

- Think back – how it all started, expectations
- What is currently going on, reality
- What the future holds
- …

C) <u>Place-dimension</u>

- Movement, places of work
- …

Thank you…

List 3.1 Interview framework

To conclude the discussion on participants the researcher takes the view of Clandinin and Connelly (2000) which states that *"narrative inquiry is a dynamic process of living and telling stories, and reliving and retelling stories, not only of participants but those of researchers as well".*

3.2.6 Results

The last research aspect that Oates (2006) listed is that research results should be communicated. It must be presented in some way such as a publication, e.g. thesis or dissertation, journal paper or an oral way e.g. conference presentations.

This research and study process and results are documented in this thesis. However, to confirm the relevance and quality of this work research outputs have been obtained in both disciplines. Conference presentations, as well as publications, resulted from this work in both the IS and narrative theory fields. Feedback at conferences and peer-reviewing of work were used to improve the work presented in this document. Section 8.2.1 presents the details of seven research outputs related to this study.

It can be seen from the last six sections how the roadmap for IS research guided this study.

The following section looks into some of the challenges that the researcher had to face during this study.

3.3 Challenges

When investigating IS failure situations (or any other incidents) it is often so that different accounts are produced from all the stakeholders involved. It seems that the IS discipline has not had much success in understanding these, sometimes conflicting, stories from the different stakeholders in order to make sense of these contentious incidents.

Narrative methods are often utilised in order to understand incidents and make sense of the experiences that people have had. Humans are role-players in failures and other incidents and their different stories need to be taken into account to be able to understand or make sense of those events. In this regard an analogy of making sense is the situation of a patient-doctor. The patient's description of the symptoms has to be listened to. Another example is the case of therapeutic sessions, where the therapist has to hear the verbal account of the client. Literature on narrative work often describes studies of psychological or social nature (Glaser & Strauss, 1999; Lieblich *et al*., 1998; Riessman, 1993). Therefore this 'borrowing' or 'importing' of methods from the narrative field and applying them in the IS field is new and not many examples exists which could be used as guidance. Given the risk of unfamiliarity within the discipline and the lack of existing guidance, it was also not clear from the start what the results would yield, or indeed, if the methods would yield any useful results. This novel application of narrative approaches within the IS field is one of the key contributions of this research.

The amount of data that is generated in such a study is enormous in that the interviews have to be transcribed, listened to again and again and analysed in order to be able to interpret findings. The hours of transcriptions resulted in numerous pages of text as indicated in List 3.1. This is an even bigger issue when the approach is repeated three times.

Another obstacle was to prove of the validity of the findings. As the IS field is predominantly and traditionally seen as a discipline where research is conducted in a more positivistic way, effort was done to indicate the change in research approaches over time in IS. As the narrative theory field was used for the analysis of the data this discipline's approaches and worldviews also influenced the way validity is defined, seen and measured in this study. Section 3.2.1 and specifically the way interpretative work should be assessed for quality is presented in this chapter. The role of the researcher in section 3.2.5 is also given to show how rigour is achieved in qualitative work.

3.4 Conclusions

A roadmap (Oates, 2006) was presented in this chapter to show how this study was planned and conducted. This chapter has presented the different philosophical paradigms that can underpin IS research. The positivistic, interpretive and critical research paradigms have been described in general. Interpretive research was discussed as an appropriate paradigm to work in when the failure phenomenon is investigated in a narrative way. The research process for

this study has been discussed. Research strategies have been highlighted and the case study as research approach and interviews as data gathering method have been presented. Narrative methods have been introduced as analysis approaches – imported from another discipline to capture the richness of IS users' experiences in order to learn form IS failures. This was stated as the purpose of this study. The contribution of the study will be discussed in chapters 7 and 8 where it is shown that the IS research methods, IS development practice and narrative disciplines are contributed towards. The roles of the researcher and the other participants have been discussed. Some challenges that the researcher had to overcome have also been presented. This chapter also indicated validation strategies for interpretive work including a process of peer-review. The results of this study are presented in this thesis as well as in publications.

This research was then a qualitative study designed to collect, analyse and interpret stories from IS stakeholder groups and their experiences in relation with others and within their organizational contexts.

In conclusion the author can justify why narrative theory had to be used to understand the IS experiences of different user groups. Other methods or theories would not yield the same rich insights. As de Roeper (2005) expressed in her dissertation 'Public Stories, Private Lives – An inquiry into the role of story in middle Australia':

> *"It is my intention to bring to life some of the people who in a quantitative study would appear merely as statistics and by doing so to invoke the cathartic power of their stories".*

The next three chapters present the application of three broad narrative analysis approaches when investigating stakeholders' experiences relating to IS failures.

Chapter 4 Retrospective narrative analysis

4.1 Introduction

This is the first of three chapters that describe the application of the three narrative analysis approaches that were used in this study respectively. Analysis and interpretation of the data will be presented. This chapter focuses on retrospective narrative analysis as a way of making sense of the experiences of information system stakeholder groups which they offered as stories.

A classical approach to analysing stories is through the use of retrospective sensemaking. When looking at stories they were historically analysed as narrative meaning stories have a beginning, middle and end (BME) or are whole and linear. This approach was discussed in chapter 2.

The aims of this chapter are:

- To identify and present examples from the accounts of the four distinctive groups of stakeholders where retrospective analysis was conducted. For each group several excerpts are shown with an analysis after that (section 4.2).
- To present a summary of the insights that were reached when looking with a retrospective lens at the accounts of the groups of stakeholders. The findings are presented for each group of stakeholders (section 4.3).

4.2 Presentation and analysis

The rich descriptions of the stakeholders' experiences of the IS under investigation were studied intensively and iteratively. In this first approach narrative analysis was conducted in a more classical way, retrospectively looking at the accounts of stakeholders. From a literary point of view narratives are often analysed by looking at different elements, the 'what', in a story such as events, actors/characters, time, place, language and words used as well as order (Du Plooy, 1986). The 'how' of the narrative can be broken down into: introduction or abstract, chronology of the story and the climax containing the central idea followed by the closure and evaluation. There may be some variation within the structure.

For this study the experiences of IS stakeholders were initially analysed retrospectively looking for story moments in their accounts. Different foci arose while analysing the accounts of the main stakeholder groups. Although there are numerous hours of transcriptions of the experiences of the stakeholders this section presents only exemplars of the different stakeholders' accounts. Notes, analyses and interpretations made by the researcher are presented. The groups are as follows:

1) Super Users (SU)
2) Users (U)
3) Information Technology staff (IT)
4) The External Company (EC)

The profiles of the four groups are described in sections 3.2.5 and 4.2.1 – 4.2.4.

4.2.1 Group 1: Super Users (SU)

The first group of stakeholders is called Super Users as discussed in section 3.2.5. They represent the division in the academic institution that operates the student administrative systems. Users' problems and errors are channelled through a Main user so that each query does not come directly to the Super Users. After evaluation of the problem, or error, they decide on handling it themselves or escalating it through to IT (internal information technology division) or further to the EC (External IT Company). They might also decide to do nothing after evaluating it as not important or not having a big impact in the environment. Some excerpts of the accounts of the Super Users and analyses from this group are presented next. More examples are presented in appendix 2:

SU1: "I was quite pleased with the fact that we moved on from a DOS program to a sort of explorer program – something quite different to that little black screen. It was completely different the Windows environment. The old people that had worked on the old Unikom system struggled to manage in the beginning, they couldn't understand the right click, but here your processes are in a different place. It was quite difficult with the users. I personally think that the development went quite well."

Analysis: This person looks back on the process of going from the old to the new system. It is a retrospective sensemaking example. It has a sort of beginning, middle, and end structure to the chronology. It closes off with an appraisal that indicates that she thought that the conversion from the old to the new system went well, and she is satisfied with the conversion process.

SU1: "It is part of how we do things. You go through the system from scratch and figure out how it works. I think that SU2 would say that the Java transition was worse because she was my backup with financials and I know the month-end specifically did not work correctly in Java and then they had to log errors and she had to explain to the campuses why it did not work correctly. At the end of the day it had a big impact."

SU2: "I knew less than the users did - especially in the beginning. It probably took me twice as long as SU1 to go and test and solve the problem. I had to literally tell the user to explain to me what you did. Step A, I went here and right clicked, I did this and that... and I have to say that I got along great with all of them. There was drama with the system and the switching over to Java and the falling over of the system at month end… I admitted it straight forward, I played open cards with them: I need your support to help me. And I immediately got help from them. They understood and there were problems, sometimes there was a lot of pressure because it wasn't just their system that gave them problems, it was my system as well that gave problems. So sometimes it was just if, if you don't know your system well, the problems, some of them take you so much longer to solve."

Analysis: These examples show the retrospective nature of the accounts. They look back from the time of problematic issues to the current state where they are handling everything much

better. There were times when the Super Users struggled to find the origin of errors in order to improve the situation and solve the problems. SU2 also asked for help from more experienced people, thereby contributing to better service delivery. She was also humble enough to ask the users to explain to her their problems step by step. Certain systems or phases of the new system stood out to be more problematic e.g. conversion to Java.

SU3: "What was really bad was that one system was in Java and the other in UDS. It was really difficult for us you know, because if you asked for a reference, you had to think about UDS and you had to think about Java. So sometimes you needed to test at two places, a double load - you know."

Analysis: The user is thinking about the time when they had to work simultaneously on two systems and there could be confusion about the different environments.

SU3: "Terrible, it was terrible because we had to take over the whole other campus and we ... what we did were, we captured the yearbooks by hand for the current year."

SU3: "No you know, it was very hard work. Look it is not... it didn't go by unnoticed, but it was very hard work. And I don't know how many people would be willing to do it, but it was fun at the end."

Analysis: SU3 talks about the forced mergers in the country where different universities and technical universities had to merge into single institutions. This had an enormous impact on the systems of the higher education institutions and as we see here also on the workload of people. Although the new system was hard work and had a significant impact on their working lives, the stakeholders in this group handled it with pride.

SU4: "I guess, I think maybe I guess that people didn't know the thing because they programmed wrong, they made programming errors, you know so I think they left it to those people, I think so, and then it didn't work out. So there were errors and the EC had to fix it, and you know you are splitting your resources between people that we support just to get the system in you know. So we felt a bit left out that time, because I feel there should always be a sense of development in a year, you can't stop developing. Because things have to go on progressively and correcting error. We came to a halt that time with Java concerning development because we just tested and struggled to get the system in Java."

Analysis: The conversion to Java while the new development was still ongoing had an enormous impact on the workload of stakeholders. We can also see that there were confusion, frustration and a feeling of being left alone at that stage.

SU5: "...and it was so-so, that we spent nights working when no one was here to work on the mainframe, because it was really slow. It took us too long to add the marks during the day, so we came to work on many nights, especially when you had to work with big groups. Then you would come in tonight at half past four, when everybody is going home, then you would come sit and work through the night. Then it goes just like that. If we worked during the day, then

most of the time we would wait for half an hour just for a page to turn. So, okay, but good, because it was in the DOS environment, like the technology and stuff changed, it got old..."

Analysis: SU5 reflects on her role in this environment. She thinks back about the problems that were encountered and shares the frustration that the system was not flexible and no new functionalities could be incorporated within the old system. This excerpt also indicates her loyalty towards her profession and the effort she was willing to put in to get the work done.

SU5: "I know that they did not rewrite everything in the new system and then they decided what they are going to develop and it was approved by the Main user group and it was implemented. Later it was found that there were clear shortcomings, I do not know whether they thought that far, hahaha, I do not know… one probably does not always think wide enough, but there were shortcomings that will be fixed at a later stage."

Analysis: The Super User looks back at the history of the development of the new system, acknowledging problem areas, which will be handled later. And it seems that this stakeholder is at ease with this state of affairs.

4.2.1.1 Summary: Super Users

The Super User group is mostly optimistic when looking back at the system. They are satisfied with the process of development and the product. Retrospectively they however acknowledge certain challenges that had to be faced.

4.2.2 Group 2: Users (U)

The User group represents the people on ground level. They are people such as secretaries, personal assistants and administrative staff that have to do record keeping, marks, financials etc. They do the work on behalf of other staff members such as their superiors and lecturers. This section presents some of the Users' accounts and analyses of the IS under investigation.

U2: "You see, it was terrible when we rolled over from the old system to the new one. Do you remember that they loaded a new version, and a new version, about every second day, and just as one thing was fixed another would stop working? That was the biggest complaint, I don't know if it was the same with other people. My experience was a bit itchy, then he worked and then not, especially in the busy times - listen to me - then we struggled. That was big frustrations."

Analysis: This user thinks back to when the system was implemented and used. She is glad that she does not work with it anymore. Her frustration with the many versions and the differences between them is clearly stated in this account. She also emphasizes the unavailability of the system in peak times when the pressure is on her to process the marks.

"But where the trouble really started was with the marks. It isn't, it isn't user friendly. Not at all!"

Analysis: The user looks back and states what types of problems she experienced with the system.

4.2.2.1 Summary: Users

The User group experience more frustration with the system than the SU group. Retrospectively certain concerns are highlighted that need to be rectified in future IS endeavours.

4.2.3 Group 3: Information technology division (IT)

This group of stakeholders is part of the university and they are responsible for the operation of the IT systems. Stakeholders from different divisions in IT were part of this study. The following excerpts are examples of some of their narratives regarding their experiences of this IS. The analyses and interpretations of relevant extracts are presented in this section of the IT group.

IT1: "It was so long ago, hey – we all still used mainframe computers. And the speed was so terrible at times, but we had to… but in the end we got it right. But it comes from there, because I'm the only one that really remembers. And then we basically did the same thing. That system still was still running at that stage. And then we just started with it, you know, UDS was a whole different language, and has another way of doing things."

IT1: "...And we had to go live real quickly. We went live on the right time. The stupid mistake we made was to bring the whole system forth, you know, put it out as ready, instead of focusing on what was necessary at that stage. In February you just wanted to know who is in your class, and want to start loading marks for him. You don't want to calculate the semester marks or final marks – that only comes in May. So what we did next was a bit difficult. If we had just focused on that, but, you can remember: we built in a kinds of snazzy stuff, and suddenly we had colour, and suddenly we had interactive stuff, and if there were new students, and he didn't have a class group, a flag showed on him, that showed he was new, and the moment he was assigned to a class, the blue flag would change to something else, and all kinds of stuff. It was very nice and cute. And when it came in, the next task was the student record system and finances – the money and records. They had to go in at the same time. We didn't want to do the interface thing, because it was a real-time system. The moment a student would register, the money would be asked, and after everything was completed, it had to be printed, and here the receipt would come out. He must have been able to pay there and then. So that was the idea then. And then we were busy for two years… I think it was two years that we worked on it. I can't even remember what year… so at the end we went live with the student- and money records. And naturally the registration was the big test… Yes. That was in the years when a new thing started on the campus. The people started camping out in front of the Registration Offices. You will remember that!"

IT1: "We just wanted to press one button, and then everything must be done, hey? And we wanted to do it in Afrikaans. Or in the language that we chose, so it made things more difficult, you know? It was totally different when the Oracle-system was brought to the table: it was in English. Point, finish. You don't have a choice. But in that time we still wanted to address students in their mother language, to send them a letter in their mother language, for every little thing we wanted to send them a letter, if they didn't sleep well, we wanted to send one and say, we hope you sleep better tomorrow. You know, we wanted to take service to the limits. So, that is the background – that is how we started."

Analysis: This IT project manager is reflecting on how mainframe computers were used previously and how a new computer environment would change everything. She also thinks back on the deployment process of the new system and acknowledges mistakes that were made. They should have phased new functionalities in as and when needed. She also shows her pride in that the developers wanted to give more than what was necessary to the users because the new technology set a new standard of what was possible in a computer system. They wanted to take service delivery to the limits because they value their clients and they are people-oriented.

IT1: "We contacted people from the east to help us with the conversion. That posed some challenges. The working hours did not correlate, we could not understand each other that well, you know because of a shortcoming in English. And to communicate to say this is not correct was a different sort of challenge."

Analysis: The Java conversion posed many challenges which she points out in this excerpt. Aspects such as language barriers, time differences and lack of knowledge of the context are raised here.

IT2*: "Basically, I started working here ... then I actually started working directly on the infrastructure."*

Analysis: This IT person's role is significantly more technical as he said he started on the infrastructure side of things. Integration with other systems is an important function that resides with him.

4.2.3.1 Summary: Information Technology

This group of stakeholders reflected on the process of changing from the old to the new system. Retrospectively looking they acknowledge the faults that were made but see the process as one of learning from past mistakes.

4.2.4 Group 4: External Company (EC)

The External Company developed this specific IS and they are still maintaining the system. They do it in conjunction with IT. They are located in the south western side of the country while the university is located in the northern parts of the country. Their physical distance from each other is around 1200km. One phase of the system - when conversion to Java was necessary - was contracted out to an abroad company (AC). What follows are exemplars and analyses of the accounts of the EC.

EC1: "We started piece-by-piece, but naturally the originals, the first ones was difficult because we knew we were in a new technology, and new thinking patterns and you made mistakes along the way. You know, you think the one computer language is just like the other, but that is not the case."

EC1: "So we thought, we know one thing a little better then another came along, and we just went on like that. Every time there was something new to learn, sometimes it was good, and sometimes it was bad."

EC1: "So that was mistake number one to not realize that we knew what to do, but we didn't quantify it correctly, we must first put down this bottom building block, which is a generic building block"

Analysis: The developer reflects on the process and the historical flow of the project. Very often she says - "you know" – as if the researcher must be aware of these issues. The excerpt shows that she is knowledgeable in her field and that decisions are made in an informed way. She also acknowledges that making mistakes is part of the learning process. Certain problems such as development approaches are singled out as being mistakes made during the development process.

EC1: "I just thought, oh my life is back to normal. But then we started with the training again, but that is another point of view, but we'll get to that later. Anyway so now you're in this development phase, and the lessons like I said we learnt, are actually that you have to work smaller and that you have to first focus on your core functionality, to deliver that to the user so that he can start working with it, and deliver the rest as you progress, because you will find that lots of times that you want to deliver, although according to spec and like you said it would be, you know, practically it would be better to have this field at the top, or swap these two windows, that would have been nice. So you know all that sort of stuff comes out, and you can't blame them even if you give them a prototype, if they don't have that hundreds of thousands of records in the background..."

Analysis: The developer reflects on the process they went through and the lessons learned. One has to focus on smaller parts and core functions in the first instance. Even if you use prototypes the user is not sure how the end product will function and feel. Aspects such as high volumes of data are not part of the prototyping approach to system development.

EC1: "… Anyway, so the management of this type of project is something that we totally underestimated, and then like I said, what they understand of what you were thinking in the first place on the day when you developed it. And that insight just isn't there because the idea that you get is there, but those people just sit there coping and because the windows aren't switched over by an automated switching process, most of the challenges were on that level. That, you know you get the client and the server code, now we got very few problems with the server stuff, but on the screen self, oh, and like I said – they said: No EC1 we can't do it. You see, and then I have to go through this whole thing. And say yes "we can do it", and then you have to let them know that we can actually do it."

Analysis: EC1 acknowledges that the management of this complex system was underestimated. There were also challenges around contractors who assume certain things are not technically possible when indeed it could be done. That took time away from the developer to research such issues in order to get to a point that the problems could be resolved.

EC1: "Because they were the Java experts and we were new to Java, and you know, we came from Unikom, Natural ADABAS to Forte, and then we had to do Java. So now you have a learning curve in your own team... but oh heavens... !"

Analysis: She reflects on her discontentment when experts were contracted in for this project. They were however not able to achieve certain activities that they were supposed to do.

EC2: "There was a learning curve and as we developed, we involved more people, so they also needed to be trained, and what I think we underestimated at that stage was leap that you had to make from the mainframe, because all developers we had were mainframe developers."

EC2: "So basically if we started with a phase we took every phase, whether it is specification or development or user testing, there was always a QA (quality assurance) involved to assure the quality. Again, it was interesting because everyone test differently."

EC2: "There were many errors, really many. I think the users were also, were also despondent especially with those two systems. I know there were a few dates that they wanted to implement which they moved every time, so I think the frustration on their side was really big."

Analysis: She reflects on errors that were made during the development process. Issues such as testing that took longer than estimated, the size of the team, complexity of the system that was not realized and planned for. Developers came from a different background than what the new system required. Testing strategies differed from team to team, and planned times to implement the system changed also – to the frustration of the clients.

EC2: "And something that we also did as part of the systems development was to convert the old data. And that was also a big issue... "

EC2: "...but the student records were horrible because the problem with the old system was, there wasn't real data integrity. So there were lists and lists and lists of data that we had to clean."

Analysis: Another issue that had to be dealt with was the integrity of the data. This was not anticipated from the start so it was if a new problem arose when they came to this phase. This also had a negative effect on the time plan.

4.2.4.1 Summary: External Company

The EC group look back at the old system and present the technology drivers of change. They reflect retrospectively on issues that can be improved upon for the process to be smoother in future.

4.3 Summary

Looking back at the examples that were presented in the previous sections and other examples in appendix 2 and providing interpretations, the following summary is presented:

The Super Users (SU) looked back at the system development in an overall optimistic way. They were mostly satisfied with the process of development as well as with the end-product – the new system. Insights that came forth from the above excerpts from the Super Users are:

- They are loyal
- They have positive outlooks
- They are at ease
- Problems will be handled along the way

They however also acknowledged certain challenges and problematic issues when looking retrospectively at the development and implementation process. These include:

- Users were struggling with the new system
- Testing took a long time
- It was hard work to operate two systems simultaneously
- The merger of universities with other institutions had an impact on higher education systems
- Their perceptions on the origin of errors were that programming was at fault
- The design of the system was not sufficiently flexible

The next group of stakeholders are the Users (U). They looked back at the new system with more frustration than other groups. They reflected more negatively than the Super Users on the implementation and operation of the new system. Concerns that they raised include the following:

- There were too many versions of the system
- They struggled with various aspects when using the new system
- The system was not user friendly
- They experienced frustrations with all the errors that occurred

In sum, the User group perceptions are negative when looking back at their experiences and involvement with the system.

The third group of stakeholders are the IT group (IT). They looked back at the process and reflected on how the old system operated in a mainframe computer environment. They acknowledged that errors were made but ultimately they could learn from them. Issues that the IT group learned from in the development process are:

- Conversion to Java –the language barrier was an issue to take into consideration
- The integration of systems were complex

- Slow lines – waiting times were long
- Data integrity was difficult to achieve

Overall the IT group was willing to give everything, and more, to their clients and users. They showed a pride in what they did and how they achieved it.

The last group of stakeholders was the External Company's developers and project managers (EC). They looked back to the system when they still used "green type" of screens. New technology was the driver to change the interface to become more interactive and user-friendly. They also acknowledged problems that occurred along the way and they learned lessons from there. Challenging issues raised by them include:

- Development approaches had to be planned and carefully selected
- Training was challenging
- Prototyping was sometimes limiting
- Data integrity was important
- Physical distance from the stakeholders was important
- Management of such a project was underestimated
- Testing took too long
- Delivery of the system was late

It can be derived from above that the EC group's perception on this journey of systems planning, development and implementation focused more on project management issues and what could be done better in the future to avoid such pitfalls. They thus show signs of developing a reflective perspective on their practice and a desire to improve their approach to managing similar projects in the future.

From a retrospective narrative approach stories with beginning, middle and end were identified where stakeholders looked back at the system and how it was planned and developed and how it influenced their work. Different issues and concerns from their own perspectives were raised when reflecting on their own IS experiences. The value of the retrospective approach was that certain main foci and elements emerged by analysing the stakeholders' stories. The following are examples of such main elements of all the stakeholders, however not shared by all of them:

- Satisfaction with system
- Got help from persons in order to survive the new IS
- Had to work very hard to achieve success
- Forged mergers impacted their workload
- Conversion to Java was challenging
- Acknowledged problems and mistakes

- Lessons learnt
- Solutions offered
- Technology was driving force
- Loyalty towards the system
- Negative outlook on the system
- Problems such as training and testing
- Success and failure aspects

Chapter 7 presents final findings of all three narrative approaches and their usefulness.

4.4 Conclusions

The accounts of stakeholders were analysed retrospectively and examples for each stakeholder group were presented in section 4.2. It can be seen that the stakeholders gave different stories regarding their IS experiences. For example, the User group very often referred to the problems they experienced while the Super Users were proud about the system they helped to maintain and improve. The IT and EC groups reflected more from a project management view and attempted to learn from the past in order to be better prepared for future developments. Looking at the accounts from a classical narrative viewpoint we can identify excerpts with retrospective nature. Excerpts were offered in this chapter where the different groups looked back in time to the process of converting from the old to the new system and how they experienced it all. Issues that were identified include problematic issues that they encountered with the new system, challenging issues that they had to overcome as well as aspects of learning through the process. These issues that emerged from the stakeholders' accounts will be presented in chapter 7 as findings and results. These include aspects such as problems listed by stakeholders, views on success and failure and solutions to problems.

It was therefore insightful to look at the stakeholders' accounts from a retrospective viewpoint. The next approach for analysing IS stakeholders' stories is presented in chapter 5 where living story is applied as the first of two post-classical approaches.

Chapter 5 Living story analysis

5.1 Introduction

The accounts of stakeholders were analysed retrospectively in the previous chapter for each group of stakeholders. As depicted there the users had different stories regarding their IS experiences. It was interesting and insightful to an extent to analyse their accounts in this way; however certain aspects and elements are ignored or not looked into during the retrospective analysis. Living story was applied as a second analysis approach as part of the research strategy. Living story as narrative theory was described in chapter 2 as a post-classical approach. To summarize main concepts again: Living story is about the movement in the present, the unfolding of relationships and interplay of the stakeholders' experiences. It is about context, the now and here, the dynamics of the role-players and the environment and of how stakeholders cope in the present. Living stories are often multi-plotted.

The aims of this chapter are:

- To identify and present examples from the accounts of the four distinctive groups of stakeholders where living story analysis was conducted. For each group several excerpts are shown with an analysis after that (section 5.2).
- To present a summary of the insights that were reached when looking with a living story lens at the accounts of the stakeholders. The findings are presented for each group of stakeholders (section 5.3).

5.2 Presentation and analysis

When analysing the accounts of the stakeholders it was realized that there are interdependencies between their accounts. There is a livingness unfolding as the information system almost becomes a character for some stakeholders. Examples and quotes from the groups of stakeholders are presented in the next four sections with analyses, interpretations and comments for each group utilising the tools and approaches from a living story perspective as described in chapter 2. More examples are presented in appendix 3.The four groups are:

1) Super Users (SU)
2) Users (U)
3) Information Technology staff (IT)
4) The external company (EC)

The profiles of the four groups were described in sections 3.2.5 and 4.2.1 – 4.2.4.

5.2.1 Group 1: Super Users (SU)

SU1: "Yes – at the moment the system has a lot of errors and as people are developing it, the system is not really becoming stable because as you develop a new thing, it affects another part of the system. We therefore have priority lists of the errors that have to be fixed for, say, registration in January, and we handle it as it becomes apparent. If it is a crises error it is

moved to the top of the list. So the system is continuously busy developing. We are not yet at the point to say that everything is working 100%. Not at all, not close."

Analysis: The above excerpt appears to have "presentment" (in current time). It shows what is going on at this moment and the system continues to emerge. The system is also without an ending - still being developed. The sensemaking here is that there are references to activities that are not finalised. There is a pathway from past through present, into future.

SU1: "You can sort of say main owner of the system, it feels strange at times, but it is your system, nearly like a mother over her baby, I do not want to hear anybody speak badly about it because we work very hard at getting it right. It is not nice when somebody on campus is negative about it – complaining that is doesn't work, then you feel that you need to protect it, we put a lot of hard work into it. But…"

Analysis: This is a powerful excerpt. This system and the story told around it are living. The system takes on livingness. For this person it is like her baby and she takes on the role as the mother. And a mother protects her baby and 'invests' in it by putting in a lot of hard work in order to let it succeed. It is depicted through this metaphor that a system is not dead and lifeless. It is not just a thing that is used during working hours. This stakeholder has feelings for the IS, she puts in many hours and she wants to protect it.

SU1: "Much better, if you are on campus they, the other campuses aren't too keen about one campus person being responsible for all three campuses, they do not want you to work on their stuff and request their stuff. It is much easier now that I am at institutional. They weren't very happy when I had to leave, but it is much easier communicating now, they don't take offence when I tell them what to do, but while I was still on campus they felt that I was being bossy, now they have less problems listening to me."

Analysis: This living story shows the context. There are three campuses, and this stakeholder shows the interrelations between campuses and the way communications has improved when the placement of her function and where she works currently changed.

SU1: "We IT people, not that we are completely IT driven (laugh), we just are not very good at communication."

Analysis: SU1 says they (the IT people) are not that good with communication. She tries to make sense of errors and offer explanations of the causes of the errors. All these handling of the users and their complaints, communication about the errors, being busy all the time – this is her living story about the system. One has to handle it – even if it is difficult; she has to learn to live with it. There is a rhythm of nagging users, calming down and going forward. They are not being "terrible drama queens" and they just try to cope with things.

SU2: "You have to almost grow an extra skin, a crocodile skin, but you get finished. You will definitely finish.... And it is difficult because I didn't have that campus financial background, it was difficult to give answers...but you get through it, it wasn't easy, but you do, you pray and you get through it."

Analysis: Sometimes the stakeholder has to dissociate herself from the problem by being thick-skinned. We can also see that not having enough background on certain issues makes it difficult to cope. But in the end with prayers she survives.

SU2: "Oh and the mommies and the daddies. It is really interesting what you hear from the moms and dads. I have got a guy, I had a dad that said to me for instance, "yes I have called last week, I just want to know, does my child write exams?" I said "yes sir". I told him, and I could hear that this dad is a pleasant person, you know, I told him, give me your child's number and if there are any problems, contact the faculty. I can try to help you to get a contact person there, then you can contact the faculty. I said but let me help you "

Analysis: It is clear from this fragment that SU2 walks the extra mile. There are relationships between the systems users and the students' parents as well. The network of further relations is shown here. Indeed, it is interesting that the discussion uncovers additional stakeholders and concerns.

SU3: "It is so, oh and look I don't hesitate to say PreviousITperson's name, look to me PreviousITperson was like manna from heaven, because he knew something about everything, because he was here for a while, you understand, he came with it and he knew exactly, you know. I mean they are very resourceful, they don't, they don't hesitate to help, but they don't have that know-how that they need yet. You know, of the management, they don't really bother us, you know, I mean we were placed here to do it, we have that responsibility and we go on with it."

Analysis: She is very grateful for the help they get from the developers. But she thinks back about help they got from an expert which she compares with manna from heaven. She remembers how this person knew the system better over time and was willing to give assistance. She also talks about management that is not really interfering with their work and leave them to their own responsibility.

SU3: "It is important to me what type of machines we have. We have some of the best computers I think and the fastest, and then our servers as well..."

Analysis: She sees technology as part of successful systems.

SU4: "A user is never satisfied, not there. Oh they are too much, they are just never happy."

Analysis: SU4 feels strongly that the users are never satisfied. And that makes it difficult to focus on new developments.

SU4: "Now good, look it is just the development but the thing is breaking the whole time, but it is because we were, they forced into the phases, you know, you people that gets out into the IT world will know that sometimes if they do something with the next development, then something else breaks you know, that type of things. Then we have to do all these remedies to get all those things right, you know, then we have to report it and test it again. I say the people here must be able to struggle, because testing is struggling. Because I have never seen it where a programmer gave me something that works…"

SU4: "…100% finished and then I put it into production. We struggle with that. It is hard work, and you have to struggle, you mustn't be impatient. You have to be able to sit for a long time and struggle and what have you, it is quite a job."

Analysis: SU4 is discussing the system and the livingness in it. She refers to the system as the thing that breaks and then they have to cope with it. Testing makes out a huge proportion of their activities. There are little story elements in this excerpt and we see the spiral of developing, breaking, fixing and testing. And one has to be able to struggle to get it right. She puts in a lot of hard work in order to conquer the problems.

SU4: "Man, it is something I see a lot you know, he, and then they sometimes say, oh goodness he never knew that, because he touches something here, and then the whole panel becomes loose over there, you know, like a piece of knitting when you drop a stitch, then the whole bag pulls loose, you know."

SU4: "And we are experiencing that at this moment and I think it is because of their personnel turnover there, quite a bit, they fix the thing and then something else breaks, and you know, you don't know that you have to go and see what it is that have broken, you come across another broken thing by accident."

Analysis: She is using a metaphor of knitting where you lose a stitch and the problem rolls over to deteriorate the situation. There are sometimes side-effects when something is corrected another problem arises. The personnel turnover at the IT division is highlighted again as a problem which causes non-continuity and movement.

SU4: "I am crazy about it – it is so cool. Make me excited, you know I love it when a plan comes together."

SU4: "I really have the most fantastic people here, because I wouldn't get a person, that firstly can't work with users and that can't, struggle. You know and it is like a math problem that like, if you had a math problem. You sit, and sit, and sit, and sit, believe me… I like it."

Analysis: SU4 just loves her work. The words she is using accentuate her feelings for the systems and the passion she has for her involvement in this work. She does not mind the hard work, struggling and effort that have been put in beforehand. It is like a mathematical problem which you have to sit and work out – even if it takes time. In the end the plan that comes together is all that count. She thinks highly of her personnel. We see here a little story within the bigger picture.

SU4: "It is, I am telling you that we have the most wonderful users over there, I am crazy about them because we work very well together."

Analysis: This shows the good relations with some of the users at other campuses.

SU4: "It doesn't bother them, you know, and I say that you should try to be as faultless as possible. So they don't always give it through, it doesn't always get through to us, and then we don't even know about it and if I don't know about it then I can't report it."

Analysis: Some people can live with errors; they are tolerant and try to cope. But SU4 feels that the errors must be given through to them via the correct channels so that it can get attention or be escalated further to be solved.

SU5: "You find your, you find a way to work around it, because if you report it, you are going to wait three weeks or a month before it is fixed. You would maybe report it, but in the mean time you start working on another way, and even if that thing is fixed you still go on in your way."

Analysis: This shows the livingness of the system and the coping mechanisms of the users. If they have to wait for solutions that are taking a long time they try to handle the problem themselves and cope in their own way.

SU5: "...I mean if an error occurs every now and then, then it is going to happen, but at this stage I think that there are too much small things that…"

Analysis: The now and here of this excerpt is that there are too many irritations that need to be solved with this system.

SU5: "Ah man, I told them a long time ago, that they should get a couple of programmers and put them here on the university's grounds, then I could say – stand here so that you can see that the thing doesn't work. Now you have to try and explain in a remedy or an email what I did."

Analysis: What comes out from this quotation is that the communication lines are sometimes too long for a query. The place also has an influence on the work activities. EC is in another city – at the other end of the country and sometimes their presence on the campus would have been better and preferred.

SU5: "Yes, you learn it as time goes by when you phone the wrong person, then he tells you that you shouldn't have called him, and I the future you should call Pete and not John anymore. I think you pick that up as time goes by."

Analysis: This is an example of how people learn over time. It is as if there is movement over time with functions and roles.

5.2.1.1 Summary: Super Users

According to the Super Users the system takes on an own character in that they feel passionate about the system. The metaphor of feeling like a mother over her baby is an excellent example of this beingness. The IS also continues to change and they have to adapt to this challenge. There is also a web of relations that is identified by looking with a living story lens. They have to survive the problems and challenges daily. They refer to the IS often in a metaphorical way.

5.2.2 Group 2: Users (U)

U1: "But where the trouble really starts is with the marks. It isn't, it isn't user friendly. Not at all. Like now, everyone is busy working out their participation marks, all those things, so that makes it slow in the first place. In the second place is that you have to wait, you have to wait your bum off for a class-list. Ha aha ha. We had that problem this morning where Lecturer1 wanted a class-list, where I had to phone her and tell her that would phone her if I have it, but it isn't there. Then you have to wait about fifteen minutes before it comes up. So it is, especially now, because everyone ... in a row that wants everything to be done."

U1: "So there, there are rather, you know, there are problems. And then another thing of the system that I have experienced, is if you do the calculations – A lot of times the lecturers says, he has four class tests, three, take the best three where the one is the lowest, and then work out the participation marks according to that. Then they say U1 do it! Do it like this. He doesn't do it like that. I can work it out on a weighted basis, and then tell him, yes here are four tests, take the best three, but he doesn't give me the option to say, calculate the lowest one with the lowest mark. Then I get a total that is different to the total that they get. They get for example, say they get 44%, then mine works out to 48%."

Analysis: Here is a classic example of requirements that the clients need that cannot be met by the system. The lecturers want marks to be calculated in a specific way and the system does not allow it even if it is needed. More voices are heard here and it appears that the views of additional stakeholder groups need to be taken into account when a system is planned.

U1: "I try to, like this morning you know, I sat down and played with it, because it is not the thing that is finalized yet, but it doesn't really give you that option, and then I would call SU5 for example and then she would say, but it isn't going to give you that option. Then you erase it and use the mark-to-text system to pull it to the way they have it. And then I put it in."

Analysis: The user works around the system and the problematic situation to be able to cope with the demands. Another user actually developed a small process that saves much time by getting the marks from a spreadsheet file that is inputted to the grading system. This indicates how users work around a problem and cope with the present dynamics of the system.

U1: "No, if you do something physical, then you realize, listen here but that what I have done doesn't work anymore, then you call U2 and then you tell U2, listen here I have done something wrong, because that what I have done now, doesn't work now, then she comes and then, it has happened that she was sitting next to me, then she would say, no this is not right, and then we would call SU5 and then she said, no it has changed. So it has happened that it, it is just that they tell you that this isn't the newest version, then you press okay, and it starts to install, and you don't know what it is installing, but… Yes I learn from my peers – other secretaries."

Analysis: All users are not sure about new versions, what is changing and what to expect. To solve this they call other users to help – again their way of coping with problematic issues.

U1: "But they tend to, while in the middle as they pick up the errors, to fix it as they go and then it comes then he makes that where you are waiting and you do this thing and tomorrow when you do it again, then it isn't the same anymore. So they have to, shut it down for a day and sort out all the problems and then switch it back on again."

U1: "But we get the small things that create problems and it is small things like here is something and here is something, which creates this big problem in the end, they don't pick it up. They don't pick it up at all. They think about the big problems that might occur and it is the small things that…"

U1: "...and according to what I could derive, the previous systems was a lot friendlier than this one, and then they say the university get too many, new systems too fast, Ha ha ha ..."

Analysis: Here are examples of how the users are caught up in the midst of changes and the dynamics of the updates and alterations happening all over them. It seems that the small problems really cause most of the frustrations. In the end she says that what she could gather from the previous system implying that it was better.

U2: "Like I said then something works that was not working, and tomorrow something else isn't working. You know, that, they don't have it. They should have tested it over two or three years. They should have kept a small group of people until all those small problems were fixed, that is why we had to make those thousands of versions in the first year. Every second or third day a new version, and a new version, and the one time it works and next it doesn't. I think they didn't test it long enough before they… but now we are the guinea pigs, the testers."

Analysis: This user is very frustrated by the many versions of the system and the fact that not enough testing was performed according to her. The inconsistencies of the system are very much alive here and these small stories tell something about the painful experience of the frustrated users of the system.

U2: "Excuse me, I want to say one more thing, if the network is down, that is frustrating as well. You, you see if you are working on Excel, then you can still add marks and stuff. If the network is down, you can't work on this thing. That is another thing."

Analysis: As participant in this research she feels she has a chance to raise her voice and views and wants to state the problem of downtime. Comparing it to a spreadsheet program that is available all the time this system poses a problem when the network is unavailable. That influences her work and the demands the lecturers have. It may put her in a bad light as not being able to do her work.

5.2.2.1 Summary: Users

The User groups refer often to their frustrations that they encounter every day with the IS. They share how they live with all the problems by offering own solutions to some errors.

5.2.3 Group 3: Information technology division (IT)

IT1: "… but it looks like it is going fast now. So it looks like there were improvements and all, but it was so new, and it was so… it was almost, you know, discoverer's work."

IT1: "… they are linking in so beautifully with each other. That's why… it is at this stage of the game… it was a very tall order. Now things are much easier. You can add a module much easier, like we call it now. Or add a piece."

Analysis: According to IT1 things are easier these days. We can see a spiral of changes over time, movement from a tall order, doing discoverer's works to the current situation where things are easier and much more relaxed. They can add modules because the foundations are already in place. Here it is apparent that the IT group perceive the IS much more flexible than the user group. The differences in perspective on the IS under study emerge from the stakeholders accounts.

IT1: "But they don't realize that they work with it every day, and if we have a vision to make things easier, they will come back to us and say: we are not used to doing that. That is also something that is a bit too much here. I know that Manager1 had a nice saying. He said, you know, on Sundays we always cut the leg of lamb in a certain way. No one has ever tried to find out why it is cut in that way, but it is done like that. If someone were to ask you why you did it like that, you'd answer: because my grandfather and grandmother did it like that. And then one day they got a hold of grandmother, and asked her, Grandmother, why do you carve the leg like that? Then she answered, my child, in those days we were poor, and a leg of lamb was a big thing, and we could only afford a small bowl. So we had to turn it around to fit in the bowl. And that is why we carve it like that. Do you understand? And now we still carve it like that."

Analysis: In this passage the focus is on change and how people react to that. The project manager tells a little story remembered from someone else about change and the fact that people often do not know why they do things in certain ways. They are then reluctant to change – even if the new way is better. The following two excerpts corroborate the users' outlook on change and the resistance to change that is also supported widely in the literature.

IT1: "Yes, and you know, they don't like it to change, they don't always think about what you are busy doing. It is like a recipe, you follow the recipe to the letter. If you differ slightly, then there is no way, then…"

IT1: "Yes, and they panic very easily. And of course, okay, that has been overcome, but Unikom was, I think it was black and white screens. Now colour is added. Goodness gracious! Look, if a blue or red flag pops up, then… totally floored… don't know what is happening! They think they pressed something wrong or something."

IT1: "Yes, the slightest thing, you know, and this woman just says don't worry about it. We also started using mouse input. You couldn't believe it! You know, if you didn't go through it, then you don't realize what it was."

Analysis: This person reflects on the various aspects of change management and echoes again the situation of change that the user so often has to face. She also illustrates another issue related to how IT people do not always take into account the feelings and background of the user when new systems are developed and implemented. The developers grow with the system while they develop it – the users get an end product with many changes and new functionalities incorporated in it which they have to start using at once.

IT1: "Look it's like testing. You go through your unit testing, and then your integration testing, and then… it always goes a bit bigger and bigger and bigger. And then at one stage you do a type of interpretation testing, if I can call it that, and in some cases we struggle with the interpretation testing, because we don't work with these things every day. It is like I have to write a system for a doctor, and he says he is right. I mean, it is only him that knows all the weird names and words, hey? If it was me, I would ten to one attach something that is in my brain to my kidneys, and it would look right to me, but it isn't…"

Analysis: The above excerpt indicates the problem when a developer does not know the context and environment of the application. She gives an example from a medical perspective.

IT1: "Yes, I enjoy it to work like that, but as a project manager, not necessarily as a developer. I would have managed the project because I have that knowledge now. Yes, I like it a lot actually. I like this type of work."

IT1: "The degree to which you prepare can be to think of everything beforehand, and to see that the people that are doing the job, have everything at their disposal so they can do it and do it good, and how you can take everyone happily on this journey, finish in the allotted time, that whole… I love stress and adrenaline! So, I think that's the thing. I don't want to just sit, and you telling me just keep going. It is not my way of working."

Analysis: In these passages there is ample evidence of the enjoyment of her work. Knowledge is important as well as preparation before the actual development. It is also interesting to hear that she likes to work under pressure and this is something not everyone is up to.

IT1: "I think it is a very nice system in the sense that… it actually does too much. It is a very snug-fit system for the University. It takes everything into consideration. It does weird stuff. If you look at an over the counter system, like Oracle, it isn't necessarily what it is going to do. The advantage of this to the University is that we get things done the way that we want it. We maybe have a bit of an advantage: we give a little bit more to students out there that some of the other Universities maybe don't do. I don't know how many of the other Universities get their letters in Afrikaans if that is what they want. You know, that kind of things. The disadvantage of such a system is that it isn't very… It is marketable, but with the technology that we have chosen, and I'm not just talking of between Unikom and what it is now, I'm taking it from the start with the mainframe. The technology as it was developed, really complicated things. How many were we earlier that worked on the system? Four? Five? Now we just need more and more people, and then we aren't doing much of the developing by ourselves. You know, so, there are just too many things. We just have to know about too many areas. Earlier

you just knew programming, you learnt about COBOL or about… whatever, you know? That is in the old times."

Analysis: She has feelings for the system – she is very positive and proud about what the system offers, everything the user wanted and more. However she also has reservations about such a system; that the uniqueness poses a disadvantage in the sense that it is not widely marketable.

IT1: "What I picked up along the way is that a lot of the earlier main users, people like SU3 and SU4, have become a lot more independent, because they do a lot of the things themselves now. Systems are being written so that they can manage it themselves. It is not necessary for us to jump in and for example - get a table date, or journalizing, that kind of things anymore, you know? They did certain stuff, but then we had to go afterwards… In the earlier years we had to print the academic records. Then we spend a lot of nights doing that. Not anymore now, they do that now. They handle it. But we made it possible for them to do it. We made it in such a way so that they can do their own thing. If they saw that there was a booboo, they must be able to just re-run. They must be able to take it back and run it again. It is not necessary that we must come between both. That loosens our hands a bit to do other stuff."

Analysis: This is a strong example where empowerment helps users to be more independent. Super Users themselves manage many changes and upgrades asked for by the users and they do not give this through to IT or EC. In this way the developer can focus on other functions and the Super Users also get empowered to deal with certain activities themselves.

IT1: "You know there is sometimes a fine line, and you need a specific person to drop the axe and say: to here and no further. Because sometimes you spend hundreds and thousands of Rands in order to make just five Rand. And that I have seen is something that we are struggling with. What a user doesn't realize, that the little that he wins, is small in comparison to what it costs. It is like buying a Mercedes just to go and buy milk every night, just because it has a small storage space that the milk fits in so nicely. I mean it is not worth it, so it is the same type of thing…"

Analysis: Here IT1 illustrates another aspect of user behaviour. Sometimes it is not worth the effort to keep trying to improve a system or functionality in order to save something. "The axe must drop" – a decision must be made to complete the system and go on. It also has no merit in wanting a sophisticated system that is not functional to ones needs. She uses the metaphor of buying a Mercedes to be able to use a nice gadget.

IT1: "You know, then I always think, some of us that have live with some things in the end… no, I think that we sometimes expect too much. We can write a lot simpler and easier… yes, systems, by not adding all these pie in the sky, top of the range, best, you know. And in lots of cases they don't even use it. I know we added something in the receipt system, hey, that they haven't used to this day. And it took a lot of time, and the system was kept back from implementing because of that. I mean, they didn't want to go on without it. And now it is 4 years later, and they still haven't used it. Then you start to ask the question: was it really necessary? You could have used that time on other stuff that has to work, that you use every

day, to test it better, to make it better, and to make it faster, than to add all those nice to haves. And it is difficult, it is not everyone that can do it and say: no, sorry to hear, you can cry about it, I am telling you, you are not getting past this."

Analysis: In this passage, IT1 reiterates that users expect functionalities in the system they do not even use. She also hints that the stakeholders who deliver systems must at some stage say no to new functionalities if it is not necessary and sometimes they are only 'nice to haves'. The realities of life come through, there are cut off dates and a point of stopping to improve on small issues.

IT2: "From the outside, ah, to be honest, it can become difficult because some of those people, they can't see the technical side at all, and now they come with their, they see this… like we had all these problems with the finances that they see something and they expect that everything has to physically… with the press of a button, it is they just see it like that: computers makes things easier but they really don't have a clue to what is really happening and what the effect is. So they would come and say listen here, we want this and then in the end, they don't really believe you because now you have to try and explain that it is impossible because there has to be a control in the system from the people's perspective. You can't do everything; the whole integration can't go through without certain factors. But it can become difficult."

Analysis: This stakeholder echoes what was said by IT1 and others in those other stakeholders are not always aware of what is technically possible and what not. It is also shown that interpersonal relations and political structures are aspects to be taken into account when systems are planned and implemented. There are references in this passage to more voices to be listened to – not only the parties with power and authority. The now and here is shown in the expectations the users have of the system every day and the one hand. And on the other hand the IT people have to operate the system within the limitations of technology, complexity, finances and time.

IT2: "I think it would be positive when the project is finished, negative is, that some things can get so stressful that you physically, nobody can get a solution, so it is a lot of digging to search for what it is and that can take you a week, because that is where the complexity comes in. The problem can lay here or it can be deeper on our servers and then the communication between us starts, so that can how can I say it, cause friction... because everybody get stressed, the users pressure us for an answer, we then pressure the infrastructure people for an answer and I think the infrastructure people and the network people... so that could be the negative..."

Analysis: This stakeholder reflects of his view of success – when project is completed he will be satisfied. Negative issues that are of concern here are stress when a problem cannot be solved; the complexity of the situation, communication issues and hostility between stakeholders. These factors all contain human elements. There is a network of relationships that cannot be negated when working with systems.

IT2: "A minute's error can cause a two months' solution, it can take two months of your time. We had a specific problem with the financial things which a single problem can really cause a two months of hard work to fix everything, so it is…"

Analysis: This excerpt demonstrates the frustration of which IT2 and his group have to deal with when errors occur. He offers an example where a specific problem with financials took two months to rectify. He ends the passage with the words – "so it is" – one just has to cope with it – that is life. The livingness of the situation is expressed here.

IT2: "Sometimes, from my side, it feels like the users didn't test the stuff good enough... maybe the users must test a little bit more if I can say that. But it can be with us, we can make mistakes as well... or EC can make a mistake. The users can make a mistake, so it is difficult to say. There isn't really, you can't point to someone specific…"

Analysis: When asked what is causing the many errors, this stakeholder gives an example of testing that could perhaps be done more thoroughly by the users. However he admits that mistakes can be made by all the stakeholders groups. No one single group can be held responsible for the errors. This system is intra-organizational and all possibilities must be investigated. This is real life – mistakes in systems can show everywhere and originate from anyone.

IT2: "So the technology and the whole, I want to say, the University with the things that we design is really, some of the technology is, it is not really available elsewhere in South-Africa, so I have to say the University's advancement on the Oracle level and things are rather...we are one of the leading companies with this technology in South-Africa…"

Analysis: This stakeholder is rather proud of what is achieved with some of the IT systems at this university. It is illustrated by these words that some stakeholders show feelings towards the systems they operate or interact with. Again the livingness is accentuated by these words of pride.

5.2.3.1 Summary: Information Technology

Although the new IS was a big challenge the IT group is proud of their achievement – also taking into account other stakeholders' requirements. This shows how alive the system is and how all inter-actors should be part of the process. They also share their lessons learnt for future projects.

5.2.4 Group 4: External Company (EC)

EC1: "Ah and then you realize: goodness, now you have to first build the infrastructure and then you can build all your systems on top of that. So that was mistake number one to not realize that we knew what to do, but we didn't quantify it correctly, we must first put down this bottom building block, which is a generic building block that makes some of the functions very simple because object orientation, so that if you build a certain kind of window, you immediately have save function, and that is just what happens when the save is clicked, but if the status gets changed the save button will automatically go on. This is all generic things so

that you do not have to do it repeatedly on every window, which there are hundreds of. It's like you have a super-window from which that rest inherits or doesn't inherit, and then it just happens, in any way, so I think that was an 'oops'."

EC1: "Okay so there is definitely a big lesson to be learnt. You, it is not just the case where you can sit and build the system. You must think and plan the bottom layer that is going to make life much easier. So yes, that was mistake number one, but we overcome it, and these days it works out good for us because of that mistake. But we got the building block down, but it wasn't always that pleasant to explain (ha-ha). Oh no, we are a bit late, we are not going to make it anymore. That, along with the learning curve, you know people always underestimate the learning curve on a task, and because the of the more complex environment, and in technology it feels like today the complexity is just increasing where we expected the complexity to decrease."

Analysis: This developer from EC thinks back to how the infrastructure had to be built. She reflects on the lessons that were learned. This is an example of a little story element – she is busy with the account and then reflects back to how things were done and why and how they improved the process. This also accentuates how they became skilled over time in order to cope with challenges. They started to use generic building blocks as a foundational layer for the development and they had to acknowledge that the learning curve also takes up time that was not anticipated fully from the start.

EC1: "Our attitude is anyway that when have to make a design change, we firstly do it on the diagram. I like a picture and I know a lot of people like a picture because you see a lot of stuff at a time, it's not that you just work with the create student function, you can see oh here the is the student, but now look at what is hanging around him – the address and the telephone numbers and who knows what else. So pictures are important to keep with us so that we know what we have, but now we can even reverse engineer from Java, that gives us the option where we have modelled business-classes, and to bring it together with the physical Java classes. Anyway, I am going off the track, so you go through such sessions. See the user, write documentation, do the design, get back, discuss the design."

EC1: "There was lots of interaction with the users. The user can be quite finicky (difficult or annoyed), especially if you don't know him in the matter. And it is not because they want to be difficult, I think it is a case of if you are going to change something; they want it to be correct…"

Analysis: EC1 describes their way of executing the design and planning, making use of pictures. This shows the interplay of actions between developers and users and other role-players. She also admits that it was not always easy to interact with the user, which also was challenging.

EC1: "Luckily we are in the higher education for a long time, so you have a gut feeling about what is accurate and what you should leave alone. So that project planning of what phases you have and what is going to be delivered is very important, to keep to it isn't that easy, but we are doing it better and better, but not entirely correct. So that is the phase of them going through the specs, give feedback and now you can develop it."

Analysis: In this passage it can be observed that it contributes positively when a role-player is experienced in the field. They actually improve over time and the process can be gone through more thoroughly and quickly. The spiral of doing, learning, reflecting and improving can be seen.

EC1: "…I mean I could write a book about it, do you understand. I can also tell them try this, or no try this. Try everything and then everyone comes back with their proposals and then you realize that you are not the only person in the world with problems; the same is happening everywhere you know."

Analysis: EC1 indicates that she can write a book on her experiences. Over time one learns a lot of things in one's occupation. She also reflects on the general fact that things are not always unique in your environment – same things happen elsewhere as well. There are universal experiences in the world.

EC1: "At least we reached the end point on some or other way. I think in terms of, so it is half the process that you have to go through just to get there. I think in terms of the user, or no there is how we see things now, because we are these outside contractors, okay and you, I have more or less explained how we went to work on it and what I experienced as the challenges that come with it. Now you get the person that stands on the receiving end and in your case, or in this case the Northwest University. And what comes with a project like this in a user, from a user's point of view, it's not just about you had this system, now we are going to make a new system and everything is fine and "honkey dory", I am not even talking about the testing and the faults and things like that. I am talking of the whole, you understand, this user could log in with closed eyes, enter a program name, enter a student number, push buttons, they did not need to look at how to use the thing. And now you give them this new thing that they have to do with their eyes open and that whole… some users are open for changes like that and are satisfied and are happy and they… like they say they embrace it. You know, good or bad, they embrace it, and they move on with it. Then you get those that choose; they are not willing to do it and they are the, the actually make life very difficult for you. I have to say, we didn't get many of them here, but from my previous experiences. Those people can make it very difficult in the sense that they will not give up on their point, and they will keep going on and those guys are usually the guys that complain at the highest authority. You know, so you think ah this guy can only complain to Pete, which is his direct boss, but then he goes and complain at the CEO and you know then the red carpet is a difficult one to stand and let him buy into the whole concept of the user and to try and condition him so that it would be an acceptable process for him. It is, I mean we say that with all projects that there must be a main user and there must be a sponsor and blah blah blah and they have to enforce authority. Someone very nice very wonderful that there is someone like that, but there is still that person on the ground that doesn't like this stuff and he must be managed and his emotional welfare I would say must be managed to make him change his mind and some people like me thinks it is wonderful, most people here are fantastic, they move on fast. But you get those difficult customers that… that is another grey hair that I have. That really makes you, you think later on that you must just give up because you, you can't take it anymore."

Analysis: This is a very good example of how reflective this developer is. In the end the system is implemented and working and most users accept the system with problems and all. But then there are the difficult people who ignore normal communication lines and complain to high authority. These incidents and users who do not adhere to set communication lines and the protocol of logging problems really complicate the day to day handling of errors. It can at times be so terrible and challenging that she thought of giving up.

EC1: "Lesson learned – do not contract work to an aboard company... they are friendly people but... I think AC1 (person from abroad company) still doesn't like me, but it is not, I told him – how can you, if I told you the thing should look precisely almost with a few exceptions, it doesn't have to look like this, and then you have to be able to tell me why it is like that, how can you think you can show me that thing through the windows, ahhh, it is horrible and ahh ... I think on their side, I mean we wrote pages and pages of test cases in Excel, you know, and if you get to the screen and you press the save button without changing anything, what can you expect? You can literally expect it per field. So now he is complaining about that, so now you fill that in and press save again. Then he complains about that, then you enter a value for that. I think we wrote books on how they should test it, but I still think it wasn't, it's as if it wasn't effective, surely it would have been a lot worse without it, but because they didn't have intimate knowledge of, number one, how you thought about your technical architecture in terms of your generic building blocks and that sort of things, they didn't care, you see, we were fanatical about it when we designed the system, if you can reuse something, then you would reuse it, you don't do something over. In India the reuse doesn't work like that. You will go and repeat that thing on every single window, you know, now you have 2122 screens and you have the same thing on all screens, you repeat it on al 2122 windows; where the great thing of having a super class type of thing is that if you want to change something of a certain type on all your windows, then you just change it here, and it is so nice that all of them change then. But huh-uh, it doesn't work like that in India. They have a yes-no. So it was a huge struggle in the business knowledge area to get them to understand it, number one, so that they could understand, or number two, to make them understand how you were thinking when you designed the building blocks, you know, it was the first system that they actually converted, so then we converted it in the same order as when it was originally written. And this one was, it was the curriculum or the academic programs that they, I think that one came in nine months late. And that is where everything was late, it was nine months late and we just stood our ground; there was no way that they were going to give that stuff like that. The windows were not done correct, and then like I said, they repeated the same thing on all 500 windows after we agreed that they will do it on a reuse basis, you know and UDS did not do it like that. Now why do they do it like that in Java? Then they tell you, and they take chances, that Java can't work like that. ...it was a nightmare to do it again."

Analysis: EC1 thinks back to the experience they had when contracting the conversion phase out to an abroad company. Here the movement from the external company (EC) to the abroad company (AC) and the interaction of them are presented. It was difficult times and we can see how they interacted with each other in order to get thing done in a functional way. This interplay illustrates the problematics when culture, language, education and background differ. The result was a late system with lots of frustrations and disappointments.

EC1: "An expert isn't always an expert. Maybe that person thinks of himself as an expert and he definitely knows more than I do, that I can acknowledge. I am not saying that I know everything. Never, but you, and there is kind of a false sense of comfortableness when a guy calls himself an expert.... and I remember him sitting there and struggling for weeks and couldn't get the stuff running. I told him that we should leave it then. You know, because you are wasting my time, my money, you are supposed to be an expert and you know, and now you still haven't delivered anything, I could have used you for other things and we could have been a lot further. And every time you ask - no just give me one more day, and after two weeks I tell him his days are finished because he is supposed to be the expert."

Analysis: The reality of people giving themselves out as experts and then not living up to standards is getting to EC1. This is a significant problem that developers have to deal with. The effectiveness of contractors - or lack thereof - has an influence on the quality of systems and keeping within the time limits. This is a challenge on management level.

EC1: "You know, the ship nearly sinks completely. There - the Titanic is sinking."

EC1: "We are trying to handle problems, I can't tell you whether it is always successful, but yes, they try. I mean you always try to keep the client happy and if the client is happy is a whole other story, but I think we try."

Analysis: The developer shows her willingness to keep the user content, but still she is not sure whether they succeeded or not. She uses a metaphor to indicate that an excellent implementation can also strike problematic situations, do not perform as expected or fail – comparing such a situation with the Titanic disaster.

EC1: "A theoretical successful project is in time, within budget and the user is excessively happy with nothing to complain about, but that you never see. Well I haven't. So I think if you, even if you didn't always make your timelines, if you can still deliver a product that the user can use and I would say about 90% of what he would have liked it, then I think you achieved somewhat of a success. I mean you can even say about 80%. If you focused on the critical functions and the critical functions work good or acceptable what can we call it, then I think you have achieved somewhat of a, then you have done okay, but having said that, the critical functions are about 3% of your system, and if it has even a small fault, then according to them the whole system is a problem. So all these things plays a role, but yes, at least you didn't come in years late, and the users are reasonably happy,... when you are going into the maintenance phase, support them with great ease and sort out all the problems and those kind of things, then I would say you are successful. If you weren't successful on the worst end of it, then when you started with the project they would have said – stop, you are wasting my money. I think that is the one, and on the other side it is probably where you have built something, but you know that it isn't easy to use, it is painful, it can do, you know the end result is that a student is going to get a degree, but the way of getting there is long and tedious..."

Analysis: She offers her view on success in projects. It can be seen from the above that her experience in the field lets her reflect on the subject of success. Even if certain aspects may not be perfect the user may still be pleased to get the product late or with less functionality or

some defects. The perception of what a successful system entails may differ from stakeholder to stakeholder or from one context to the next.

EC2: "We as developers sometimes think that the system is used in a specific way, and if you go and look at what the users are doing, then for us they are doing the weirdest things, but that is how they do their daily work. Something where, what I have learnt from a lot when the student records system went into production, it went into production that December just before the University closed and that January they did the registration on it. And then the university insisted that I stay there for the week because I was the team leader. But what was good for me there was that you could see how the system is actually used and I think if a developer could just know it beforehand sometimes."

Analysis: This excerpt illustrates how important context is. Developers and users think differently and these groups do not use systems precisely in the same ways. This is why it is important for the developer to see and know the environment where the system, will be implemented and operated. This passage also demonstrates how the users cope in their daily interaction with the system – "but this is how they do their daily work".

EC2: "Because sometimes what you feel is a good flow of things, isn't necessarily nice for them."

Analysis: Again the context is accentuated. Perceptions differ and it is important for the developer to see and understand the view of all stakeholders involved in order to supply what is needed and will be used.

EC2: "Something else I also want to do differently is to really show the user there how much this stuff costs, because I think if they know the monetary value and I am literally talking about the money value, because we do impact analysis, now if we get changes coming in, we do an impact analysis on every single change to see where it touches the system, and how many hours it is going to take."

Analysis: The users do not know about costs of systems. According to IT2 if they have been knowledgeable they would perhaps look differently about their needs and requests.

EC2: "And it is, it is ironic, we have done a very big project with the student numbers, and if you ask them about the fifty reports, ten of them do not work, but when we ask them if we can throw these reports away because they don't use them and they don't work in any case, they would say no it would be nice if they work so you have to fix them, you have to make this change to it, so now we have to firstly fix all the errors on it …"

Analysis: This account contains reference to what people want but do not actually use. It is referring to reports that are not used or are not correct at this stage but when asked if it can be removed the users are adamant that it must stay and the errors fixed.

EC2: "They do not see the bigger picture...Or not just that, it is just a personality thing, because you do get older people that can change quickly."

EC2: "People struggle to accept change – this is something I learned in textbooks, and now I experience it – more than once it happened."

Analysis: This is an example of theory and practice that get together by reinforcing and confirming one another. The issue of resistance to change is again echoed by this developer as previously also discussed by IT1.

EC2: "And it works ten times better than in the past, so I think that is what we are trying to do, to identify things that didn't work in the past and to try and change it."

EC2: "Yes, they don't have appreciation for what the university actually accomplishes, because I think again there are no companies, accept for the university, there are no companies in South Africa that could implement both HR and finances as fast as the university. I think the University deserve a compliment for it."

Analysis: This developer thinks highly of this achievement and is very proud of this system. This excerpt illustrates the positive attitude she has about what is accomplished here. It is also obvious that lessons has been learned and applied in new developments.

EC2: "Yes, but I always love to talk about the system, it is close to my heart, so I enjoy it."

Analysis: This is another example of how the developer feels about the system. The echo of closeness and positive feelings is accentuated by this developer as it is also heard from other developers. She actually uses the terms – ''close to my heart".

5.2.4.1 Summary: External Company

This group also share the lessons learnt from this development process. The living story approach made it possible to identify contextual issues, inter-relational elements and the movement of the system, people, technology and processes.

5.3 Summary

The above examples of the stakeholders indicated the perceptions of the different groups of stakeholders on aspects of the IS and their experiences with the Information System. Some differences are presented in this section. A summary per group is given to indicate the different viewpoints of the involved stakeholders as there are differences in perceptions between the groups.

The Super Users shared their views on the information system under discussion and it was resonated from them that the system is a living entity. The system continues to emerge and materialize and adapts in order to adhere to a changing environment and new requirements. Other forces that necessitated movement in the system are governmental regulations, new functionalities and errors that had to be resolved. They placed emphasis on certain issues from other groups and the system they have to deal with. These include:

- They do not want to be a call centre – so communication must be channelled along the prescribed lines and not directed to them by the users.

- The communication line to the developing company (EC) is too long. They have to work through IT.
- They handle the users and calm them down.
- They have to cope with the nagging users.
- Users are never satisfied.
- The view that the thing (system) is “breaking the whole time”.

Apart from dealing with the problems we can also see the web of relations with the other stakeholders. No system is developed and used in isolation.

How they cope with daily problematical situations was also included in their accounts. They just had to survive at times as the following situations demonstrate:

- They are not ‘’drama queens’’ and try to stay calm and handle issues along the way.
- They deal with the problem not the person.
- They referred to daily issues as “you pray and get through it”.
- The quote “success comes with hard work” shows how they were prepared to put in long hours in order to get good results.
- The one participant referred to their ability to be able to struggle.
- Another excerpt was “testing is struggling”.
- A view on their cycle of activities was: If the system breaks, they have to fix it. They struggle, they test it. It is hard work to overcome the problems. This shows the non-linearity of their tasks.
- They refer to testing in the following way: “Testing is not a simple story”. This demonstrates the cyclic and iterative nature of tasks.
- “You become empowered” – with experience over the years they could diagnose errors much faster.

The above examples put emphasis on the way the super users have to cope daily with negative and challenging situations. This involved different activities and other stakeholders. They improved over time to handle errors.

The super users often used metaphors and other figures of speech examples in their accounts. The following are examples of the language they employed into their accounts.

- They are not “drama queens” – they try to stay calm and deal with problems in a composed way.
- “Manna from heaven” – an experienced person from IT came and helped to solve their problems.

- "Like a piece of knitting when you drop a stitch, then the whole bag pulls loose" – when you work on a certain aspect it may result in a side effect elsewhere. Or the effect of one issue is bigger that you initially envisaged
- "Like a math problem" – the super user compared the system's challenges with a mathematical problem and she stated that she loved it when it worked out well.
- "Jolly good system" – the super user expressed her pride towards this system.
- "But it is your system, nearly like a mother over her baby" – this excerpt demonstrates the almost human feelings towards the system and her emotions of having to protect it at all costs.

From the above we can almost feel that the system is alive in the way the referred to their interaction with the system. They have feelings for the system and the system is taking on a character.

The User group focused more on their frustrations which they encountered with the daily use of the system. Problems they shared include the following:

- The requirements are not met – for example the calculations are not flexible as asked for by the lecturers that have to calculate marks for the students. The users are then pressured by the lecturers for different functionality.
- The many versions that are rolled out every now and then are frustrating.
- The long response time waiting for the system is annoying.
- The many fixes caused side-effects and the new errors had to be logged and new ways had to be found to overcome problematic issues.
- When the network is down the whole system is down.
- Some reports were reported as difficult to interpret.

The Users sometimes solved the problem themselves or worked around the issues in order to cope with the system's intricacies. A few examples of helping themselves before escalating a problem upwards include:

- They tried other paths in the system.
- They asked other users for help.
- They developed a spreadsheet program to input the large number of marks into the system in a shorter time.

It is seen from above that the users try to work around the dynamics of the system. The nature of the system and their involvement of now and here necessitates that they have to cope and make plans as error logging and resolution frequently take a long time.

The IT group felt like discoverers when looking at and talking about their system. It was a “tall order” that was expected from them but in the end they achieved it. Problems that they presented and referred to in their discussions are as follows:

- They hit obstacles along the way.
- The many uncertainties is a given.
- Users panic easily.
- Users can be lazy – they just want to push a button.
- Sometimes the developers do not take the users inexperience into account.
- The system and infrastructure is complex.
- The whole picture is not known to all the stakeholders.
- Sometimes the system must get finished even if all aspects of the system are not completed - “axe must drop”.
- Some clients do not have insight into the technical possibilities and that created interpersonal tension.

We can derive from the above statements that the problems that were presented by the IT group originated from diverse angles and from different levels. Technological concerns, stakeholders’ views and abilities, their own incompatibilities, contextual issues, political pressure and so forth. This illustrates the multi-plottedness of these accounts, the interdependency of the product (system) and stakeholders and their involvement.

The IT group also raised aspects in their accounts that demonstrated how mindful they are during their involvement with different clients and the system and when they reflect on the process and environment. A few examples are listed:

- They are better equipped now – after learning lessons from previous experiences.
- They admitted that they do not always take the difficulty of the impact of change on the user into account.
- They stated that they are task driven and reflect on other issues of their work environment – “we need more and more people”, “there are just too many things”.
- They have to prepare beforehand and think about many things as part of planning before a project starts.
- The want to lessen the workload of users, they want to empower them.
- They realize that the users have sometimes “pie in the sky” demands. Not everything can be given to them. There are limits.

These aspects also indicate how the IT stakeholders have to cope with daily demands from different role-players.

The IT group also showed pride in what they achieved.

- “We are one of the leading companies” – a strong statement made with confidence.

- "It takes everything into consideration" – presented with pride in her voice.
- "We made it possible for them to do it" – evidence of how the user was empowered.

There were also a few fragments of interesting language use in the stories of the IT participants such as the following:

- "It is like buying a Mercedes just to go and buy milk every night, just because it has a small storage space that the milk fits in nicely" – sometimes a simpler and cheaper solution will suffice.
- "Drop the axe" – stop and implement.
- "Pie in the sky" – not all sophisticated requirements can be delivered.
- "On Sundays we always cut the leg of lamb in a certain way. No one has ever tried to find out why it is cut in that way, but it is done like that" – people do not always know why they do things in a certain way.

The excerpts are indicative of the little story moments in the accounts of the stakeholders. They also recalled other people's voices when talking about the system. Again the "multi-voicedness" is evident.

The EC stakeholders presented numerous times in their accounts the lessons that were learnt during development of this system. They gained knowledge over time and actually put the knowledge into place with a next opportunity. The following are some of the lessons they shared or aspects they realised during the time:

- Put generic things like building blocks into place.
- Make use of pictures in planning.
- Listen to your "gut feeling".
- Keep things simple.
- People sometimes are not what they say they are.
- Remember the learning curve – that takes up time – so plan for it.
- Success can be different than defined in textbooks.
- Programming languages have their own intricacies.
- Work more in phases.
- Be wary of cultural, language and expertise differences when contracting people on the projects.
- Take the context and environment the system has to operate well into account – spent time physically there in order to assess the reality of how things are done.

The above list contains elements of contextual issues, technical matters, political and interpersonal relations, intra-organisational aspects, managerial and human matters and so forth. The here and now of the system and process demands have to be met. The system and

processes are moving and people and practices must adapt to changing needs and circumstances. The whole system (people, processes, technology) displays dynamics and change over time.

Interesting language and metaphors used during their accounts include the following:

- Grey hair – the developer referred to different problematic issues she had to endure and solve during this project. It had almost a physical impact on her.
- Big cannons – these words are used to described the huge subsystems as part of the comprehensive system.
- Bunny jumps out of the hat – reference is made to aspects that were not thought of beforehand.
- Iceberg – testing can be deceitful; bigger than anticipated.
- Titanic - even a beautifully designed product can become a failure or strike obstacles.
- Close to my heart – the developer has feelings for the system, it takes on livingness.
- I could write a book about it – the developer came across so many situations and lessons learned in this project that she felt she could write book on all the experiences.

By applying a post-classical narrative approach to the accounts of stakeholders viz. living story useful aspects emerged. The value of using this approach as a sensemaking device lies in what was found when analysing the different accounts. A living story lens identified dynamic, non-linear and multi-voiced properties in the stories of the stakeholders. Interrelatedness of the different accounts was evident by looking at little fragments from different viewpoints. Living story also showed that accounts cannot be fitted in linear structures of proper narrative. Cycles of struggling, reporting problems, testing, and living with the changes were identified with this lens. Living story was useful to see that the environment and system were experienced as dynamic and that the stakeholder groups had to cope and made plans. In the accounts the small voices were heard and identified. Not only were official stories shared and listened to, the marginalised were also given a voice and their perceptions shared.

Chapter 7 presents final findings of all three narrative approaches and their usefulness.

5.4 Conclusions

The different IS stakeholder groups accentuated issues from this information system from different perspectives. This hints towards the multi-plottedness of the situation. The Super Users were very satisfied with the system and their accounts demonstrated how they coped with everyday challenges. The Users coped through the livingness of the system each day by applying own remedies to handle challenges and frequent versions. This emphasises the dynamic character of the system and the environment. The groups that work more on the technical side (IT & EC) were more positive and also described the users' issues that they need to manage. There was evidence of the intra-organizational nature of the system as it has to be

managed by taking into account all the role-players nationally and internationally, externally and internally. A very strong sense of attachment to the system as a living entity came from the user that calls the system her baby and she sees herself as the mother. One developer also said the system is near to her heart and thereby the feelings towards the system are demonstrated. This shows the livingness and presentness of the system. It was also concluded from analysing the accounts of the different groups that stakeholders have different perspectives on the system, the daily interaction with it and the characteristics thereof. For example, the IT group perceive the system as flexible and easy to use whereas the user group differ greatly in perception. These differences in perspectives are important to take into account when planning and developing a software system.

When compared to the retrospective approach from chapter 4 there is evidence that the living story lens looks deeper and more voices are heard for this phenomenon under this magnifier. Problems are highlighted and interpersonal and intra-organizational issues surface that would not have been possible with a classical approach. It became apparent by analysing the experiences of the different groups how the stakeholders cope with every day challenges in the here and now in this dynamic environment.

The next chapter presents the third analysis of the accounts of the stakeholders with the focus on antenarrative analysis.

Chapter 6 Antenarrative analysis

6.1 Introduction

Antenarrative is about prospective sensemaking, taking into account contextual information and multi-voices in stories as introduced in chapter 2. Complex patterns of interaction can form where fragments of stories link to other fragments, restorying the pieces into new logic. Moving patterns are acknowledged that may lead to improved sense making.

The aims of this chapter are:

- To identify and present examples from the accounts of the four distinctive groups of stakeholders where antenarrative analysis was conducted. For each group several excerpts are shown with an analysis after that (section 6.2).
- To present a summary of the insights that were reached when looking with an antenarrative lens at the accounts of the groups of stakeholders. The findings are presented for each group of stakeholders (section 6.3).

6.2 Presentation and analysis

In chapter 2 the notion of classical and post-classical narrative methods has been described. The antenarrative approach used in this chapter is also a post-classical method that stems from the living story approach and the three-dimensional narrative inquiry space (Boje, 2001; Clandinin & Connelly, 2000). Future aspects were referred to when studying the experiences of the stakeholders. Antenarrative as described by Boje (2001) seemed to fill the bits that were not described in previous approaches. Antenarrative may point towards the future and predict what is still to come. However antenarrative also point towards incoherent, unplotted and fragmented storytelling where many voices can be heard. In this regard the study also took into account the antenarrative analysis options as described by Boje: story network analysis and microstoria analysis. This was described in chapter 2.

The following four sections present examples of antenarrative excerpts throughout the accounts of the groups of IS stakeholders. More examples are presented in appendix 4.

The four groups are:

1) Super Users (SU)
2) Users (U)
3) Information Technology staff (IT)
4) The external company (EC)

The profiles of the four groups were described in sections 3.2.5 and 4.2.1 – 4.2.4.

6.2.1 Group 1: Super Users (SU)

SU1: "I feel that we are busy all the time, it feels as if everything flows together, as if there aren't any in-between phases. But when it was implemented, because it was so new, it felt strange, until you became comfortable with it. It took me a year to become comfortable with

the system. Where we are today you know exactly what to do, I don't think there is anything in your part of the system that even the EC can tell you about. In the future, there is something new with the new functionality. I don't see myself going away from where I am now. I enjoy what I do throughout the month. I enjoy having control of the student system, the financials, and every day is a challenge. It is interesting."

Analysis: In this passage we can see the turn from retrospective narrative to an antenarrative (in the future). It seems that SU1 is predicting or forecasting – she does not want to go away. She also accentuates the fact that she is very comfortable with the system – she knows it very well.

SU1: "Such decisions don't come from us, it will have to be from a high level, but they don't work with the system and don't know what goes on in the system, they don't work with it on a daily basis. I don't see the need to implement a new system anywhere in the near future. Not with the system as it is at the moment, with all the new stuff that is in the pipeline for development, I can't see the need for a new system."

Analysis: In this excerpt SU1 gives her opinion when she was prompted about the future. Her perception is that the system is adequate as it is and do not need replacement in the near future.

SU3: "You know, I said the other day that if I think back at all the years that I have been at the university, then a system lasts five to seven years, then they want to get a new one, so, but that said if they come now and say there will be a new system then I think it is, then they are announcing my retirement."

Analysis: Even though SU3 is very positive about the current system and she would like to keep working with it, she has her doubts. She displays hesitation when she reflects on the possibility of a new system. She uses the word "retirement" to present her ideas of her future with a new system.

SU4: "I don't want to do a new system again, I went through three now and it saddens me, it is hard work. I want to develop now, you know that is what I say and then every time they almost freeze, I would almost say they freeze our development if you go to a new system, because now you have to give the priority to get into a new system and I like it that new functionality is getting developed, so I want to take a few years, because the systems came very fast. I want to develop for a few years now, so that there would be new fun stuff for the users."

"Yes, I don't want a new system now immediately. They say we are not going to real fast, then I would retire really quickly."

Analysis: This stakeholder discusses her futures ideas as that of staying for a few years on the same system as it is very hard work to work on new functionalities. She can reflect on this as she has gone through a few developments and she can recall the frustration every time that she was part of it. She wants to improve the system and give users more things to work with – the "fun stuff". SU4 displays similar perceptions than SU3 in not wanting to participate in the

development of new a system when asked if she is willing to work on a similar system. She interestingly uses the same term – that of taking an immediate retirement.

"Work again on such as system: Then I take my bag and run"

Analysis: SU5 is totally honest when answering the question whether she will work on a similar project. She resonates with what other Super-Users already mentioned. She wants to get away from such a situation – "take my bag and run".

SU5: "I think there is room for improvement and further developments that can be done on the system, I mean when students and users become more it will be necessary."

Analysis: She offers her viewpoint on future developments of the system. There will be movement in the system when the environment and situation of the university change. The systems have to change and improve. There is morphing in the system when the context shifts.

6.2.1.1 Summary: Super Users

According to this group as new system is not necessary in the near future. They are happy with the current system but acknowledge that improvement is necessary in certain aspects – especially as the environment and sometimes externals factors are changing.

6.2.2 Group 2: Users (U)

U1: "Not really a new system. There are a lot… you can improve on that system, there is room for that, for example, there are a couple of gaps that they could improve, and then they could look at the system's flexibility like for example this year where the... because a lot of the lecturers are asking for it. It is not just listen here this and this, sometimes they have more than four tests, sometimes they have six or seven and it doesn't give you that option. And they want it because that is how they want to compute it."

Analysis: When asked whether a new system is necessary – this User opposed the idea. She rather suggests that the current system can be improved and be made more flexible by providing functionalities that the user needs. She is mindful about the people she interacts with and understands and portrays their frustration with a system that is inadequate in certain aspects. Requirements are given from the users for a future version of the system. Small voices must be acknowledged.

6.2.2.1 Summary: Users

The user group feels that a new system is not a necessity, but the current flaws need to be fixed. They also list issues that should get attention in future. Here it is seen how the small voices must be heard in order to adhere to their needs.

6.2.3 Group 3: Information Technology division (IT)

IT1: "And we are moving to version 12, maybe in a year or two, and I told them, we should start telling them now what is going to change. For the simple reason… start things…Yes start brainwashing them, then it won't be all at once, you know very often with a new system, the

interface is different, the process differs a bit and the way of working changes. And this is too much to absorb at once."

Analysis: This developer/project manager predicts the future when new versions of the system might be necessary. She advises that in order to prepare the user for changes they should begin to systematically get them ready. She uses the term "brainwashing them" for future changes.

IT1: "Yes, so, we catch things out, then for instance, stupid example, in place of Degree Passed, something like Church is displayed. So for him it looks right, but if you carefully read it and try to interpret it, it doesn't make sense. It looks as if things are filled into the fields that look nice, but it is not correct."

Analysis: This excerpt refers to a problem they had with context when the abroad company helped with the conversion. IT1 gives an example in retrospect of which things to look out for in future. If stakeholders are not aware and knowledgeable about the environment, context and specificities the systems operates within, they can make errors without realizing it.

IT1: "But it isn't that easy anymore. You must know how operating systems work; you must know how all these weird technologies with cell phones work, because look, now students want everything via cell phones. He just wants to press a button, and then get his results. I mean: some of the older folk aren't familiar with that stuff. We struggle to read our email. So the things you need to know are much more. For us starting to use the internet now, security started becoming an issue now. In the mainframe-time we didn't really have problems with security. You got a username and password, and as long as you remembered them and told no one, you were okay. That's not enough anymore. So, you know, it is becoming a tall order if you want to know about everything, but I mean, it is exciting. You stay… You don't stagnate. And what happens now, is that the younger men or guys that come in, actually know more than senior people when it comes to technology. But not necessarily the system, or the way that you look at a system. You know, the history stuff, policies, procedures, that type of stuff."

Analysis: IT1 gives an example of the morphing of requirements and knowledge of people when working with systems – during time lapse. New technology necessitates new capabilities older people are not always open to change and the younger generation insist on newer ways of interaction with systems. She calls it a "tall order" to try and adhere to this pressure. Systems requirements change, people's capabilities and technical users expertise all have to morph over time. We obtain here the prospective sensitivity that is needed for the future of systems. Younger people will come with new knowledge but the older people will still have tacit knowledge and experience of the environment in which the system operates. This excerpt also shows the passion of this project manager for her work. The future to her is that she learns new things, new people come in and you can learn from them as well.

IT2: "Yes, people are going to complain three years from now, but why do I have to wait thirty seconds, why doesn't this thing want to save, but then you don't realize all the technology and working hours and actually the time that went in to get it at that level."

Analysis: IT2 predicts that users will complain in future about performance that is quite good now but in future might seems unsatisfactory. Users get accustomed to new systems and fast response times – and they seem to want more and more as time goes by. They demand better and faster systems.

IT2: "It would never be a dead system; there will always be so much more new things that we could achieve."

Analysis: This is a dominant view of IT2 that change within systems is a given and it happens currently and it will happen in future.

IT2: "… I think the, the views of the University at this moment, I don't think we will ever stop, we are now half in the leading position that, I mean other people can start learning from us, from the systems."

Analysis: This excerpt illustrates the perception of IT2 that the university is a leader in this area and he is proud about it. Even other parties can use this expertise to gain knowledge from it.

6.2.3.1 Summary: Information Technology

This group works from a different viewpoint. They refer to preparing all the users to get them ready for future, inevitable changes. In this way resistance to change will be addressed. They also look into the future with new technology trends in mind and how this in going to impact the current installation.

6.2.4 Group 4: External Company (EC)

EC1: "… yes you learn from it, I have to say, that if I have to do it again, I'll do it better, ha-ha. There probably are other challenges on the map that that I have forgotten about."

Analysis: EC1 reflects back and states that she has learned from the process of system development, but acknowledges that if she has to do it again she would probably do it better. From experience however she can predict that there would probably be other problems that are out of her mind.

EC1: "That is the technology, as things are standing today. But then again, technology is moving at such a great pace, that in a four year project it could be outdated in year three, so, but at least we had, such things you have to think about as well, it is not that you are sitting on your own dump, you do your thing, you are satisfied, but your client that pays for a big part of the development, hasn't always known you in the matter. That cooperation was a challenge as well. Okay so, like I said on the, the user's side, but also on the infrastructure or the technology side, but over the years I have to say again, it was fantastic to work with the department here. We understand each other very good; we work really well together, maybe it is because we know each for a hundred years…"

EC1: "No, there are things that you will to better and do differently from your experience, but I don't think that there is something, you will never say – Oh, that was a perfect project, the

people worked together nicely, the architecture wasn't a problem, the technology or the physical machine, the hardware or the language that you used."

Analysis: EC1 is honest and states that things will never be perfect – not now, not in future. Many lessons have been learnt over time and they tried to incorporate it in work practices, but even then there will be not perfect system.

EC1: "Some days I feel like I am going to start coding again, ha-ha."

Analysis: EC1 realizes the frustrations with developing and managing a project. She has previously referred to getting grey hair as a result of all the challenges that she had to face. She predicts that she might think again to become a programmer – like in the good old days when she did not have that many responsibilities.

EC2: "I would do it differently – not to incorporate everything at once. The users said, it would be nice to have this functionality and after 5 years they have not used it."

EC2: "An open source tool will be the thing to use for reports. There would be a benefit for the company to use open source software."

Analysis: EC2 emphasises the lessons that she has learnt. In future she will work in phases giving the most essential functions for the users first and then later on delivering the "nice–to-haves". She also predicts that more open source tools will be used in future for report-generation. This will be beneficial to the company. They must have a competitive advantage and stay on track with new technology. We can see moving patterns in the system, the technology to be used as well as the company where the systems are used.

6.2.4.1 Summary: External Company

This group often looks back and acknowledges how much was learnt within this project so that the knowledge and expertise can be used in future developments. They also know what the future holds. As in the past, things will not be easy with new projects. Certain things will be the same for example users' resistance to change and infrastructure problems.

6.3 Summary

The above examples showed fragments from the accounts of stakeholders that present prospectiveness and future elements. The Super User group said they were quite comfortable where they are now and they do not want a new system in the near future. They have knowledge about potential new features that are coming and therefore there is no need for a new system. They appear to work happily with the system and they are mostly very content with their involvement. Three persons of this group said without hesitation they will retire or take their bags and run when if asked to work on a new system similar to the current one. It can be derived from these statements that the present system drained them physically and emotionally in a sense. They gave everything to this project. There was acknowledgement that the system may be improved in future developments and thereby we see the morphing in the system, context and environment.

The User group echoed the sentiment that a new system will not be necessary in the near future although they concentrated in their accounts often on the errors in the system. They referred to errors and flaws that could be rectified in future. Issues such as the following were listed by the users that should get attention:

- Flexibility
- Gaps in the system
- Accuracy
- Fluency
- Speed

The users work on the system in command of their directors or other stakeholders such as lecturers. The user group is therefore mindful about what their clients want and how they need it. It was evident that everything in the system did not operate according to those needs. Here we observe how small stories must be listened to. The small voice must be heard in order to locate specific and real problems and requirements. There are multi-voices that manifest in this setup of the system and environment that should be taken into account for future developments and enhancements.

The IT group referred to the preparation of users for the future when changes will be inevitable in the foreseeable time. The sooner the preparation begin the better prepared they will be – and resistance to change will be addressed in this manner. The IT group looked back retrospectively at how things changed over time from the mainframe environment to the current status of an improved user interface system. They also glanced prospectively and corroborate new trends within the technology that need to be kept in mind with new developments. They do not stagnate; newer people come in and issues such as security become an issue. However the current knowledge within the group is also necessary for younger staff to learn from. They also predicted that users will complain in future about technology that is currently good or adequate but in future will not adhere to standards. This is an example of how the dynamics on the technology, environment, people and system level work together and influence each other.

The one External Company's stakeholder said she will do it better the next time – thereby acknowledging how much was learnt within this project. However she knows from experience that there will probably be other obstacles and uncertainties along the way. She demonstrated insight that in future – as in the past, things will not be easy with upcoming projects; the users will be difficult to satisfy and the infrastructure will pose challenges and other issues will need to be resolved. When referring to the future she even mentioned going back to her programming job and gives up her role as project manager and developer – displaying evidence of frustration and responsibility that sometimes gets the better of a person.

This EC group learnt specific lessons that for future projects they will take it into account –e.g. work more in phases to deliver better and smaller pieces of functionality. Another issue is the use of open source tools that will be employed in future developments.

As can be seen from the above discussions of each of the groups of stakeholders, the antenarrative approach is helpful to identify prospectiveness within their accounts. Their feelings about their future regarding the system are highlighted. The smaller voice is also heard, errors are identified and lessons learned are put forth and thereby influencing the future (development and operation) of the system.

Chapter 7 presents combined findings of all three narrative approaches and their usefulness.

6.4 Conclusions

There were a few references to prediction and future prospectiveness in the accounts of stakeholders from this IS. It can be derived from the accounts that in future the User group wants an improved system, which will satisfy their needs better. The Users have a typically smaller voice in this environment but we can see how important is it to listen to the small stories also in order to ascertain the real needs on ground level. Interestingly, the other three groups also take the Users' needs into consideration for future systems and enhancements. Some of the stakeholders do not want to work on the same type of system in future. In general the three non-user groups are more realistic about the system but are also more positive in their outlook. The information system and technology are also changing over time and stakeholders' roles evolve and their own actions must adapt to handle changes and circumstances and challenges that are encountered on a daily basis and for future operations. The dynamics of the system came out and it was extracted from the accounts that it will inevitably influence the future of the system and the stakeholders' interaction with it.

All of these aspects – prediction, small stories, changes over time, dynamics of the system and environment, lessons learnt for the future - came forth by using an antenarrative approach. The usefulness of placing the accounts of stakeholders under an antenarrative investigative lens was shown in this chapter by presenting analyses of stakeholders IS experiences from this viewpoint.

Chapters 4, 5 and 6 presented the analysis of the accounts of stakeholders with three broad narrative approaches demonstrating the usefulness of each approach indicating what aspects emerge from the different narrative approaches. The next chapter will put together the findings and present final results of this research.

Chapter 7 Results and evaluation

7.1 Introduction

The previous three chapters described the analyses of the stories from the IS stakeholders according to three narrative approaches encompassing both the classical and post-classical stances. The three approaches that were used are retrospective narrative analysis, living story and antenarrative analysis. The analyses of the accounts from a more classical narrative viewpoint lacked certain depth and richness as shown in chapter 4. By applying post-classical approaches deeper insight was gained into the experiences of the IS stakeholders. These were presented in chapter 5 as living story and in chapter 6 as antenarrative.

This chapter summarizes what was presented in chapters 4-6. It also compares, discusses and gives evidence of findings of the different narrative approaches that were applied in this study. Mappings of elements identified and categories obtained from the data are presented in a variety of tables and lists. These results emphasize the need to investigate the accounts of IS stakeholders with a multi-perspective lens in order to gain rich insight into the IS failure phenomena. Findings from these approaches are presented in section 7.2. An evaluation of the three approaches is then offered after which the contribution of the study are presented and conclusions are given.

7.2 Results

The following sections present insights into what was learned from classical (retrospective narrative) and post-classical narrative approaches (living story and antenarrative) as they were applied to the accounts of the experiences of the different groups of information system stakeholders.

7.2.1 Classical approach: Retrospective narrative analysis

Chapter 4 presented the analyses of the accounts of the four main groups of the IS stakeholders from a retrospective narrative view. It was seen that the typical elements that emerged from applying this approach were insightful and interesting. There were certain themes and foci that appeared from analysing and interpreting the excerpts. Character identification is a main activity in a classical narrative analysis approach. The characters that came forth by analysing the stories or were referred to by the stakeholders were mainly the four groups of IS stakeholders as introduced in section 3.2.5. However they referred to other role-players (characters) that also had an influence or were part of their work practices and had interaction with the system. These also include external role-players such as government and an abroad IT company. The following figure presents the main characters and interaction with other role-players externally or internally as identified through retrospective narrative analysis.

As seen in figure 7.1 there were different characters identified apart from the main groups of stakeholders. Each of them has interaction with other groups or individuals. There was even an abroad company from the East that had helped with the conversion to Java. This indicates how boundaries are widened up (globalisation) when IS projects are developed.

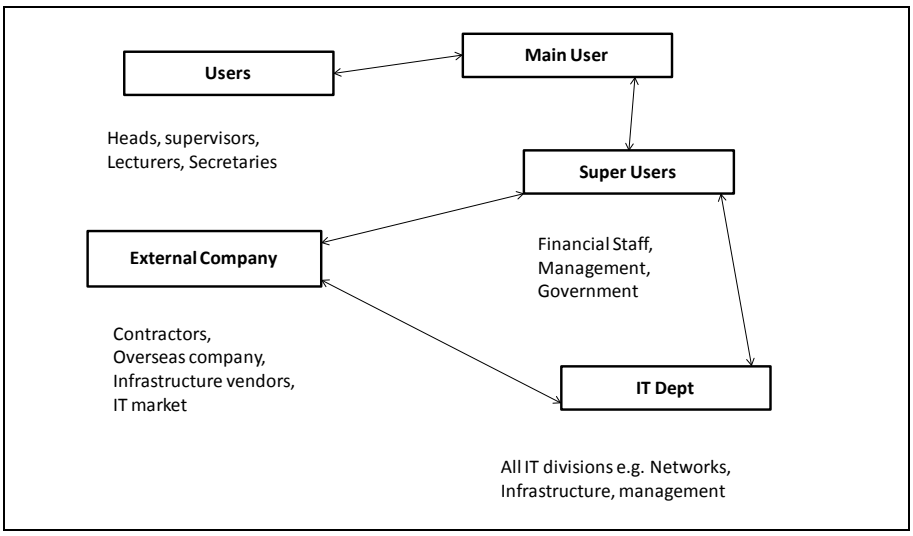

Figure 7.1 Characters and interaction

Apart from character identification, main themes and elements are identified while doing classical narrative analysis. The stakeholders in this study presented stories with beginning, middle and end. The stakeholders looked back at the system and how it was planned and developed and on how it influenced their work. The different groups emphasized different issues and concerns from their own perspectives when reflecting on their own experiences. Significant elements that emerged from the stories that the stakeholders shared with the researcher from their different perspectives are summarized in table 7.1. The summary was compiled by analysing each stakeholder's account iteratively and when the focus point was uttered or implied repeatedly by stakeholders it was taken up in the list. Numerous examples were given in chapter 4 where the stories were analysed with a retrospective approach. All four groups shared their roles they fulfil each day and what their responsibilities within the system are. They also shared their views on success and failure within IS. The two focus points that were shared by all four groups of stakeholders as problematic are that of training* and testing*[7]. This indicates the importance of these issues for future developments. The User group mostly uttered negative comments towards the use of the system, which indicates their frustration with everyday coping in between errors, unavailability of the IS and new versions that need to be used. The Super Users and IT groups stated how they had to work hard to achieve success with this IS. The technology orientated groups (IT and EC) referred to many technical issues as main foci in their accounts. These issues are aspects such as data integrity, conversion to Java, complexity of the system and speed of communication lines between the developer and the company. These three groups (SU, IT and EC) also acknowledged that they made mistakes and EC and IT stated that they learnt from the mistakes for future developments and they offered solutions to problems. The list of main themes is presented in group context in table 7.1 with each stakeholder-group's main impressions of their IS experiences in retrospect:

[*7] These two aspects of training and testing inadequacy were mentioned by all four stakeholder groups.

Main foci **Opinions**	**Super Users (SU)**	**Users** **(U)**	**IT division** **(IT)**	**External company (EC)**
	Admin, System users	Mostly secretaries/ admin staff	Developers and project managers	Developers and project managers
Satisfaction with system (product)	X			
Process of conversion from old to new system went well	X			
Got help from persons in order to survive the new IS	X	X		
Had to work very hard to achieve success	X		X	
Forged mergers impacted their workload	X			
Conversion to Java was challenging	X		X	X
Loyalty towards their profession	X			
Acknowledged problems with new IS and mistakes made	X		X	X
Experienced frustrations with new IS		X		
Learnt lessons from mistakes			X	X
Shared pride	X		X	X
Gave solutions: e.g. had to use phases			X	X
Data integrity was important			X	X
Distance was a problem	X			X
Complex system	X		X	X
Slow communication lines - infrastructure			X	X
Technology was driving force			X	X
Loyalty towards the system	X			
Negative outlook on the system		X		
Training was a problem*	X	X	X	X
Testing was a problem*	X	X	X	X
System was late			X	X
Sharing their views of success and failure aspects with the researcher	X	X	X	X
Offering and applying own solutions			X	X

Table 7.1 User groups and main opinions expressed in retrospective sensemaking

The above table indicates that certain focal points are shared between groups such as the conversion to Java that was challenging for all of the groups except for the User group. The conversion had to be as seamless as possible for the general system users. And that was how it was experienced by most of the stakeholders. Some expressed opinions which were unique to a particular group. An example is the feeling and expression of pride toward what was achieved by the Super Users. It can be seen that the developers and project managers from IT and EC (External Company) concentrated on management and technical issues. When they

reflected retrospectively they acknowledged that errors were made. However they claimed that they learnt through the process in order to rectify such issues in future.

The problems, main focus points, concerns and issues that the stakeholders discussed in their stories from this phenomenon resided on many levels such as managerial, time, place, technical and so forth. The stakeholders highlighted issues in their stories that seem important to them, which indicate that they look from different angles to the information system in use. These levels upon which the stakeholders' issues reside on emerged from narratively analysing their stories as presented in chapter 4. These different levels are shown in figure 7.2.

This figure shows again the IS in the academic environment with the three campuses. The main groups of stakeholders that interact with the system are shown. The issues they had with the system and the levels on which they reside emerged from analysing all the stakeholders' accounts. These are indicated in figure 7.2 as managerial, place, political, project management, social, software development practice, technical and time.

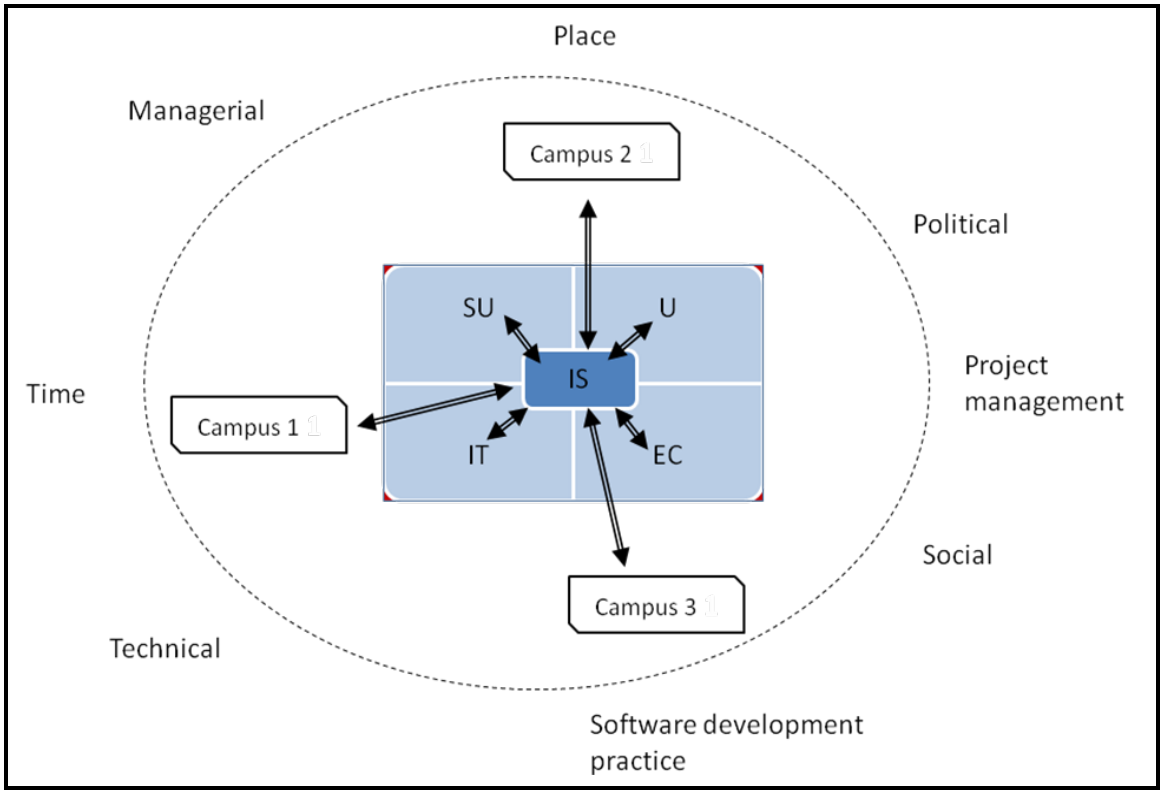

Figure 7.2 IS stakeholders – different levels of their issues and concerns (own construction)

The levels presented in Figure 7.2 are listed alphabetically and do not present any order of importance. All these aspects mattered for the stakeholders and were important for them to recall when sharing their experiences with the researcher. The concerns raised ranged from people issues to technological issues. Some of the influences were from inside the company and there were forces from outside as well such as governmental regulations on higher education. It can be derived from the above discussions, table 7.1 and the retrospective examples from chapter 4 that interesting and insightful elements and themes surfaced from the narrative analysis approach and each stakeholder group highlight issues as seen from their viewpoint.

There is however a gap and apparent lack of depth that could not be gained with this retrospective narrative approach. For example: Context is not evident, interpersonal relations and power struggles are not highlighted and multi-voices are not heard on this phenomenon of IS experiences. The next section presents the results from the post-classical narrative approaches that were also utilized in this study. The value of using additional analysis methods is shown by presenting the results of the living story and antenarrative analysis approaches.

7.2.2 Post-classical approaches

When analysing the accounts of the IS stakeholders with different approaches the researcher could observe livingness and prospectiveness in the situation under investigation. The analysis was presented in chapters 5 and 6 respectively. Some of the aspects that emerged through living story analysis indicate antenarrative as well. This is the reason for combining the results of the post-classical approaches together. This is also shown in table 7.7 where the multiple lens for analysing accounts of IS stakeholders are compiled and presented.

7.2.2.1 Living story

There were references made by the different stakeholders showing intra- and trans-organisational relationships when analysing the stakeholders and their interaction with the system through studying their accounts. The system was experienced very uniquely by some of the stakeholders; it takes on a beingness that is beyond the "objectness" of it. The system and each stakeholder's involvement with it, is almost like a football game. The players function in relationship with the ball and with each other. The system has different players in relationship with it and they simultaneously have differences. The stakeholders are all narrating about the system in different ways. Signs and expressions of feelings were uttered by some of the stakeholders. There were emotions visible in their accounts. Stakeholders were mostly enthusiastic to share their IS experiences with the researcher. There were often foci of failure situations – especially when the User group referred to challenging incidents. The Super Users were mostly very positive about the system. It was as if dominant narratives emerged by analysing the accounts of the stakeholders. Very often the underrepresented role-players feel marginalized but in this study everyone got a chance to air their perspective on the situation under scrutiny. The User group in this IS for example is not usually participating in constructing a post-project review. When asked to participate in this research they felt part of the process and they enthusiastically shared their views. They were honoured to be part of the study – to be able to share – to be listened to. Very often the stakeholders used the words "you know" as if they expected the researcher to fill in the blanks and have knowledge about the IS. It was also clear from the fragments that most of the stakeholders adapted to the problem environment and functioned more educated. Some of them offered solutions to their daily problems – indicating their reflective contribution on the failure situations. Dominant areas that were highlighted by the stakeholders and which emerged through analysis of their accounts are as follows:

1. Aspects of successful systems (Table 7.2)
2. Aspects of failure in IS (Table 7.3)
3. Problems experienced (Table 7.4)

4. Solutions invented and employed to address certain problems in order to cope (Table 7.5)
5. 'Neat' things or aspects of pride (Table 7.6)
6. Characterisation of the IS (List 7.1)
7. Attachment to the IS (List 7.2)
8. Prospectiveness (Antenarrative – discussed in next section, List 7.3)
9. Guidelines for IS practice (discussed in next section, List 7.4)

Aspects of successful systems

The first of these important topics were the stakeholders' views on successful information systems which are summarized in table 7.2. The stakeholders were asked to share their views on what a successful system means to them. By analysing the accounts of all the stakeholders certain differences and certain agreements emerged which confirms the initial discussion on success and failure in chapter 2. The Super User group said it implied good technology while no other group referred to that. The Super Users and User groups referred to the availability of a system when the system services were needed. The User group wants a system to be flexible, fast, and fluent and meet their requirements. The IT group said that users had to be empowered by the new system; the new system must integrate well with other systems, it must be better than the previous system and must deliver service to the users. This indicates that they keep certain technical issues in mind when sharing views on success within systems.

Aspects of success	Super Users	Users	IT	EC
Good technology	X			
Availability of the system	X	X		
Meet specifications	X			
Give expected results	X	X		
User satisfaction*	X	X	X	X
Independent use of system	X		X	
Error free	X			X
Flexible		X		
Fast		X		
Fluent system		X		
Manageable user manual		X		
Adhere to needs		X		
Integration with other systems			X	
Within time limits			X	X
Empower users			X	
Better than old system			X	
Service delivery			X	
Within budget				X
Crucial functions must work				X
Maintainability				X

Table 7.2 Aspects of IS success according to the IS stakeholders

From the interviews it was evident that all four groups agreed that user satisfaction*[8] is important for success. It was indicated in chapter 2 that the literature very often list user involvement and understanding users' needs as very important for achieving success. This is confirmed by the results from analysing the interviews in this study. It can also be seen that the traditional views of project success that imply meeting time and costs constraints are not referred to by all groups. The IT and External Company groups list keeping system development within time limits as a success aspect while only the External Company lists staying within budget as a success factor. This could indicate that traditional definitions on success of systems should change focus to reflect real perceived issues. Table 7.2 presents the different groups' views that came forth from their accounts - mapping the groups and their success factors in IS . They accentuated some aspects they would like to have and experience in a successful IS and development thereof.

Aspects of failure in IS

In the same way another topic was apparent and that was IS failure which is summarized in table 7.3.

[8] User satisfaction was shared by the entire stakeholder group as a success factor for IS.

Aspects of failure	Super Users	Users	IT	EC
Inadequate testing	X	X		
Inadequate training	X	X		
Side effects	X	X		
Specifications unclear	X			
Programming errors	X			X
Communication*	X	X	X	X
Inadequate knowledge	X			X
Going over schedule	X	X		
Money not enough	X			
System not flexible		X		X
Inconsistencies between systems		X		
Not user friendly		X		
Too many changes		X	X	
Speed - system too slow		X		
Too many uncertainties to manage during development			X	
Scope creep			X	X
Cumbersome				X
Not easy to use		X		X
When the client stop the project – it is seen as a failure				X

Table 7.3 Aspects of failure in IS according to stakeholders

The stakeholders shared phrases that reflected failed situations that they viewed as failures in IS. It was analysed by the researcher and certain differences and some agreements surfaced. The Super Users and Users groups list inadequacy of testing and training as factors leading to failure. The same two groups indicate that many side-effects from the system lead to failure with system use. The Super Users and the External Company feel that programming errors are indicative of failure. The Super Users also feel that when specifications are unclear it may lead to failure.

The traditional definition of failure implying exceeding time and budget constraints are also indicated by some of the groups, however it is not very pertinently indicated. Both the Super Users and Users groups refer to going over schedule, which may indicate their negative experience with the system development time as slow – and not on time as planned. The factor that is listed by all four groups is that of communication*[9]. This indicates the importance again of non-technical aspects that can lead to failure if not done properly. And this is actually admitted by some of the stakeholders during their interviews that they are not good with communication. This is a lesson to take note of to empower all stakeholders to

[*9] All the stakeholders groups referred to inadequate communication as an important factor for failure in IS.

improve on this aspect. Interesting is the issue of ease of use. The User group complains about the system not being easy to use and stipulates this as a failure factor, and then the developer group – External Company admits that ease of use is a failure factor. This is a necessary characteristic of a system. It is a factor of failure from both a technical and users' (non-technical) viewpoint. Both the User group and the IT group list that too many changes may lead to failure. Scope creep is seen from two technical views (IT and EC groups) as a possible failure factor. The two user groups do not refer to scope creep. The External Company view is that when the client stops the IS project for whatever reason then it is the ultimate failure. The following table maps and presents some of the IS stakeholders' concerns and issues on failure as it was emphasised by each group during the interviews and the analysis thereof.

Problems experienced

The other prevailing areas that emerged from analysing the accounts are presented next and summarized in table 7.4. Numerous problematic aspects that were encountered came forth from the stakeholders accounts. These were not necessarily failure factors, but were issues with the systems that made their work difficult and caused frustrations. The three groups that are more technically oriented said that they are not really good with communication – acknowledging that this may impact how you understand and interact with other stakeholders as seen above as well. It is also admitted by the same three groups that the many new versions might be confusing to the User group. The Super User and IT groups identified high staff turnover as a problem as continuity is compromised in this way and new staff need to get recruited and trained. User friendliness was a big problem for the User group while the other three groups did not mentioned this as a problem. The User group also found aspects such as long response times, calculation inadequacy, and flexibility of the system, training and complexity of interpreting reports as problematic for them while the other three groups did not list it as important problems. Three of the groups (U, IT and EC) complained about the side-effects when changes had to be done. The IT and External Company groups identified the resistance to change that users express as problem that they had to overcome. The same two groups also admitted that there were too many things at once that had to be done and said that they will work more in phases in next developments. They also acknowledged that they assume things and did not always consult with the other role-players. The User group explicitly referred to the fact that they had to work on the old and on new system at the same time and this practice made it difficult to cope with all their work. The User group listed also other aspects that matter to them once they got a chance to voice it; e.g. speed, ease of use etc. These are examples how the smaller voices are heard and they should be continuously be acknowledged. The problems identified by the stakeholders that emerged from analysing their accounts are taken together per group and are shown in table 7.4:

Problematic aspects	**Super Users**	**Users**	**IT**	**EC**
Not good with communication	X		X	X
Did not have enough time for new functionalities	X			
Users are confused by different systems	X		X	X
Users do not report errors	X			

Sit for long times and struggle	X			
Staff turnover is high	X		X	
Too many errors initially	X			
Programming errors	X			
Not user friendly		X		
Response time too long		X		
Calculations not according to needs		X		
Not flexible enough		X		
Training inadequate		X		
Complex reports		X		
Many steps		X		
Change too often		X		
Side effects with changes		X	X	X
Data get lost		X		
Not enough testing		X		
Errors with statistics		X		
Users resist change			X	X
Change management problems			X	
Developer assume things			X	X
Too many things at once			X	X
Integration – user do not see the whole picture			X	
Management issues - do not understand technology	X		X	X
Working simultaneously on old and new system was difficult		X	X	
Language barrier			X	X
Wanted to give too much – ''nice to haves''			X	
Users have false notions of costs			X	X
Unique system – specific to higher education			X	X
Programming languages are not the same – each has their uniqueness				X
Infrastructure changes and is complex			X	X
Report generation problems				X
Underestimate architecture				X
Data conversion problems, data integrity not good			X	X

Table 7.4 Problematic aspects in the IS and process according to stakeholders

Table 7.4 indicates the problem areas and challenges the stakeholders encountered while the system was being developed, used and operated. When analysing the accounts as living story these fragments came out to indicate the problematic issues that the stakeholders experienced. The unofficial stories were also heard. All the stakeholders' voices mattered and they could share freely with the researcher. By applying a deeper looking instrument it was

possible to hear the smaller stories – microstoria (Boje, 2001). Often certain role-players in an organisation are underrepresented and their stories are never heard. In applying another lens the fragmented and competing discourses are also taken into account to get a comprehensive and collective account of the phenomenon under exploration.

Solutions invented and employed to address certain problems in order to cope

Another main theme that materialized from analysing the accounts was that of offering solutions to problems. The stakeholders had to cope daily with problematic issues and had to make plans to handle these situations. By analysing their stories it was evident that the stakeholders managed to survive at times that they could not wait for the long time it took to rectify some challenging situations through the official channels. The technical oriented groups of IT and EC made use of prototypes and made sure to involve the User group more frequently. They also prepared more thoroughly before going to a next phase. These two groups also learned that there is a time to go live with the system – no matter how long one can still be busy improving small things in the system. The following table (7.5) maps some of the remedies the stakeholders invented, thought about and used:

Solutions	**Super Users**	**Users**	**IT**	**EC**
Use prototypes			X	X
Involve user			X	X
Thorough preparation			X	X
Decide at some stage to cut and go live			X	X
Training			X	X
Keep context in mind – observe how users work			X	X
Phases			X	X
Pilot system			X	X
Ask peers for help in difficult situations	X	X		
Work around the problem		X		

Table 7.5 Solutions suggested and used by the IS stakeholders

It can be seen that the technical stakeholders thought of and applied remedies from their own perspective – having expertise on technical and management and system development level. The two technical groups namely IT and EC used prototypes, tried to involve the users regularly and attempted to work in phases. The User group that struggled day to day had to ask peers or make an effort to work around problems. This is indicative of the dynamics of the system where every stakeholder must try to survive in this environment. They had to adapt to circumstances.

Aspects of pride

From analysing the fragments of the stakeholders' accounts it was also evident that pride was an aspect not always acknowledged by management and other role-players. In sharing the stories of their experiences of this IS they could air their views and augment the view of the

researcher by offering these things that they thought were neat and represent achievements. Aspects they are proud of are presented in table 7.6.

Aspects of achievements and pride	Super Users	Users	IT	EC
Good knowledge	X			X
Good relationships	X			X
Trust in their superiors	X			
Feelings for the system	X			X
Learn to work around the problem	X	X		
Help one another	X	X		
More paths to get to a result		X		
Try to meet changing needs			X	X
Accommodate users' needs			X	X
Learn lessons			X	X
Technology decision – use Gartner group indicators				X
Design building blocks to build more parts of the system			X	X
Empower users to become independent			X	X
Reflect on roles of all stakeholders e.g. users, contractors–mindfulness				X

Table 7.6 Achievements that emerged from the IS stakeholders' accounts

The entries in table 7.6 indicate that the User group has referred to fewer aspects of pride and achievement. They were mostly negative about the system with all the errors and frequent changes they had to live with. However, they refer to the ways that they helped each other and worked around problems. The developers (EC and IT) and Super Users had the highest number of references to what they achieved throughout the lifecycle of this IS. The Super User group's feelings of pride resided more on a people and interpersonal level, while the IT group was proud of how they were willing to accommodate users' needs. The EC group's achievements resided on project management, people and technology levels.

Characterisation of the IS

The next dominant story element that came forth from the analysis was characterization of the IS. The IS was referred to repeatedly by stakeholders as taking on a livingness. The system was to a certain extend being personified. Some of the stakeholders talked about the system in such a way that it seemed alive and not fixed. It was as if they had a relationship with the living object. Their roles were influenced by the system that challenged them with dynamics and changes. The system was not neutral; it invoked interaction, emotions and their reflection included values. In analysing their stories by a deeper looking mechanism of living story the following terms used by the stakeholders emphasised the characterization or personification of the IS.

• *"it feels strange at times, but it is your system, nearly like a mother over her baby"*
• *"the thing"* – referred to negatively
• *"I think it is a very nice system in the sense that… it actually does too much"*
• *"if they are happy then we know our whole system is happy"*

List 7.1 Examples of characterisation

Attachment to the IS

Going further than characterization there were recurrent expressions by some stakeholders that they had feelings for the IS. The analysis revealed that there was a sense of attachment to the information system. They had to protect it, nobody should talk badly about it, and they put in a lot of hard work to get it to where it is. The affection for the system came mainly from the accounts of the Super Users and the External Company groups. To a certain extent the IT group also indicated feelings towards the IS. Examples of attachment from their accounts are as follows:

• *"I do not want to hear anybody speak badly about it because we work very hard at getting it right. It is not nice when somebody on campus is negative about it – complaining that it doesn't work"*
• *"You feel that you need to protect it, we put a lot of hard work into it."*
• *"I am crazy about it – it is so cool. Make me excited, you know I love it when a plan comes together"*
• *"Close to my heart"*
• *"I am very proud of this system"*

List 7.2 Examples of attachment and feelings

It was also seen that the dominant narrative of success in this system by certain stakeholders was negated by the small stories of problems and negative encounters with the IS as expressed by other stakeholders.

It can be seen by the above discussions that living story enables the researcher to look beyond content and constructs of the accounts. Attachment to the IS is shown, characterization of the IS is seen, power struggles emerged, deeper feelings and attitude towards the IS are identified. Context is evident.

Next the last narrative approach is discussed.

7.2.2.2 Antenarrative

Chapter 6 presented the accounts of stakeholders by approaching it through antenarrative theory. A few examples could be extracted from the stories indicating prospectiveness. This is then the last prevailing theme that is presented for this study that came forth from the stakeholders' accounts. Future references to the IS and the stakeholders views on future activities are presented in this section. The majority of stakeholders did not respond positively when asked if a new system was necessary or whether they would like to be part of a similar project in future. This all could be indicative of the complexity and dynamics and challenges of the current system that are just too huge to comprehend to be done over again. Some of the fragments that came through the accounts are as follows:

• *"I would do it differently – not to incorporate everything at once"*
• *"An open source tool will be the thing to use for reports. There would be a benefit for the company to use open source software"*
• *"I don't know if I will do it again. I am too old now, and I don't have the energy"*
• *"Yes start brainwashing them, then it won't be all at once, you know very often with a new system, the interface is different, the process differs a bit and the way of working changes. And this is too much to absorb at once"*
• *"There are a lot… you can improve on that system, there is room for that, for example, there are a couple of gaps that they could improve, and then they could look at the system's flexibility"*
• *"I don't see myself going away from where I am now. I enjoy what I do"*
• *"You also handle it better as time goes on..."*
• *"Work again on such as system: Then I take my bag and run"*

List 7.3 Examples of prediction and future elements

List 7.3 shows that stakeholders shared some thoughts on future possibilities regarding the system and further improvements. Chapter 6 presented examples of the antenarrative analysis of the accounts of stakeholders. It was seen how the stakeholders had to cope with daily frustrations and they made plans to cope with the intricacies of the system. It also emerged from the analysis that patterns are shaping in time. For example Super User 1 shared her IS experiences as one of a failure trajectory at times. She is doing her work with the IS, and when problems occur, she cannot really come out of the situation although she feels to take her bags and leave. She has no choice but to move on. She is also aware that the system will get better and things will loosen up. ("*The system is continuously busy developing...*"). This spiral is called a pattern shaping in time (Boje, 2011). This pattern can be presented as follows in figure 7.3:

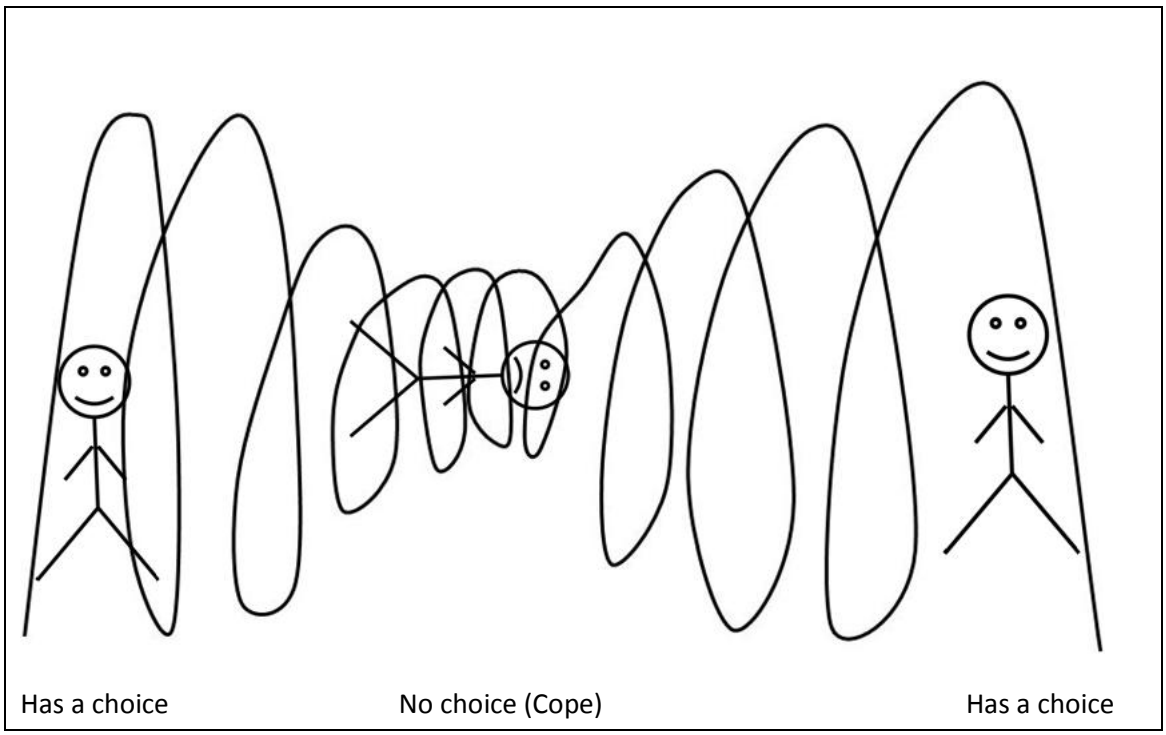

Figure 7.3 Failure spiral – pattern in shaping (Own construction)

This pattern is important to note for future IS developments from this case history. The traditional system development methodologies with phases and cycles do not fit these relationships between IS stakeholders and the errors and problems they experience. We see a spiral of coping with problems and the stakeholder caught in-between trying to cope and move on.

Antenarrative analysis opened up a further dimension of looking into failures that stakeholders experienced. Multi-voices look into the future of the system and themselves intertwined therein. It is evident that internal and external stakeholders' views are important to take into account when investigating IS failures and planning new IS.

Specific guidelines can be extracted from the results of the three narrative analysis approaches presented by the above discussions, tables and lists of certain issues. These can be presented as guidelines to the IS development community. Some of the factors or elements are well-known to IS developers and some may be surprisingly simple, yet all were important to the stakeholders in order to get and use a system that adheres to their crucial needs. The following list (list 7.4) proposes some of the issues that emerged through analysing the stakeholders' narratives:

• Listen and talk to all the stakeholder groups to elicit a collective requirement set for new systems – even though their views may be multi-voiced. All perspectives must be incorporated.
• Context is important – developers should know and get familiar with their clients and their environment.
• Attain buy-in and establish trust for all the involved stakeholder groups.
• Communication lines between stakeholders – e.g. for error–reporting, should be considered and made simple.
• If external stakeholders are involved make sure that they are available in the specific physical environment where the system is being used – especially during new versions or new deployments.
• The development life cycle phases should be reconsidered for each project and planned implemented for the specific context and roles-players. E.g. how will testing, training, users manuals etc. be handled in this environment, with these stakeholders in order to get optimal interaction and value from the system for the benefit of the client.
• Empowerment of users is of essence. How will the IS – the end product - aid to reach this goal?
• Keep newer versions of the system to the minimum and with the minimum side-effects.
• Develop the complex system in phases – this was uttered many times.
• Technology drivers – such as open source tools can be used in future.
• Be careful and mindful about who is contracted into a project. Language and communication and culture do contribute to successful outsourcing.
• No system will ever be perfect – acknowledge this fact.
• Views on what constitute success and failure within IS may differ between different stakeholders in a system.
• Prepare users in time for a new system or new functionalities.

List 7.4 Guidelines suggested for IS development practise

It is seen from list 7.4 that the guiding principles put forth by these IS stakeholders range from technological issues to the most basic people oriented strategy of listening to everyone. The small voice of the Users - such as the problems that they experience or what they see as failure or success - must also be listened to. Stories from previous IS and experiences have the potential to guide prospective IS developments.

The next section presents an evaluation of the retrospective, living story and antenarrative analysis approaches as they were applied in this study.

7.3 Evaluation

The research question of this study as proposed in section 1.6 was:

> *How can narrative analysis methods be useful to make sense of IS users' experiences in information systems failures?*

Three broad narrative approaches were applied iteratively to the accounts of the experiences of IS stakeholders. To assess usefulness of the narrative methods a definition of usefulness is given: Merriam-Webster (2013) defines usefulness as follows: "*the quality of having utility and especially practical worth or applicability*". Practical worth refers to the following: "*appropriate or suited for actual use*". Synonyms or related words for usefulness include: "avail, service, utility, advantage, benefit, gain; aid, assistance, applicability, appropriateness, fitness, relevance; profit, value, worth, efficacy" (Merriam-Webster, 2013). These aspects were kept in mind during the assessment of the narrative approaches.

To assess the value of the different approaches the following discussion highlights the aspects that were found relevant, applicable and of practical worth. Conclusions that were drawn are presented when applying the different instrumentation to the accounts of the stakeholders.

The retrospective narrative approach looked at stories within the accounts with beginning, middle and end referring to past incidents. It was useful in that insight was gained into the stakeholders' experience and involvement with the information system. Their involvement stretched from planning, development, testing, and implementing to maintaining the system. Diverse characters were identified: the main four stakeholder groups as well as other role-players from within and outside of the company. These characters were shown in figure 7.1. Certain themes and topics emerged from analysing their accounts. Table 7.1 indicated the main themes that were extracted from the stakeholders' accounts. Three groups were mainly positive about the system. However the User group complained very often through small fragments in their accounts about problems they encountered on a frequent basis. Important foci that emerged throughout the accounts were listed in table 7.1 and in the whole of section 7.2.1. by utilizing the retrospective narrative analysis approach.

Two different narrative analysis approaches were there after applied to the accounts of the stakeholders

Living story and antenarrative theory as post-classical approaches were subsequently used as sensemaking techniques or instruments when analysing the IS stakeholders' accounts. Living story analysis looked into the now and here of the accounts. Dynamic, non-linear and multi-voiced properties were identified in the stories of the stakeholders. Little fragments came through to show the interrelatedness of different accounts. It was learnt that accounts cannot be fitted in linear structures of proper narrative. There were ebbs and flows apparent in the accounts. Stakeholders had to cope frequently with challenges and at times they were doing a good job with it. They had to find a way out at times for themselves – they had to survive – especially certain stakeholder groups. Sometimes things were going well – particularly with

those users who were experienced and knew the system well. Sometimes there were cycles of struggling, reporting problems, getting a new version, testing, asking for help and living with the changes. The environment and system were seen as dynamic; the stakeholders had to cope and made plans. In the accounts the small voices were heard and identified in this case very often the User group. Not only were official stories shared and listened to, the marginalised were also given a voice (Tables 7.2 - 7.6) confirming the interplay of narrative and antenarrative of stakeholders where dominant narratives in this setting were tested. This was introduced by Boje (2001) and also confirmed in the study of Reily (2010) focusing on stories of officers in the US navy. Furthermore the Lists 7.1 -7.2 summarized the deeper themes that emerged through analysing the accounts namely characterization of the system and a strong sense of attachment to it. The system is almost taking on livingness. Expectations of what stakeholders would like to have in a successful system have also been shared – and this indicates how important it is to hear all the stories.

By using an antenarrative lens the prospectiveness in the accounts emerged where stakeholders glanced into the future stating what they would like to experience in a new or improved system. Voices were heard how the stakeholders would feel about working on a similar project in future. A few stakeholders indicated that they would rather run away – accentuating the complexity and hard work they put into the system and almost being left with no energy to do it again (List 7.3). The researcher became aware of how rich the accounts were when identifying elements and aspects by exploring the accounts with a deeper looking tool. This could not have been possible with a classical narrative approach.

What emerged through traditional narrative analysis of the accounts of the stakeholders are the different levels of their issues with the system. It can be seen as a meta-narrative that is constructed from the different views. Figure 7.2 indicated this. What followed was the level of complexity of this IS and the environment that was evident when looking deeper by applying living story and antenarrative analysis. Figure 7.4 indicates the different levels on which the stakeholders identified their issues with the IS as originally shown in 7.2. This is now strengthened by the other narrative analysis approaches. Figure 7.4 is constructed to indicate interrelatedness, networks, complexity (Urry, 2003) of the system and its environment, pressures and forces working in on the system, changes that happens in the system and within the stakeholder groups and with the environment. These demands are from inside and outside the company that compel this system to be dynamic according to the stories of the stakeholders. Nothing is static; the system lives and need to adapt to changes. Stakeholders need to adjust to changes. The star-like circles (movement) in figure 7.4 indicate the almost constant moving and changing of different elements in this setup:

- The system (1)
- The stakeholders (2)
- The environment (3)

The figure attempts to accentuate the complexity of the phenomenon showing different inter-actors and interaction with other systems from the researcher's point of view. There is livingness in their stories– the system continues to exist with role-players and in the different

contexts. There is also a prospectiveness to be seen in the stakeholders' stories. This system - and stakeholders - has to change and adapt in reaction to internal and external drivers. This all was revealed by analysing the accounts of the IS stakeholders in post-classical ways.

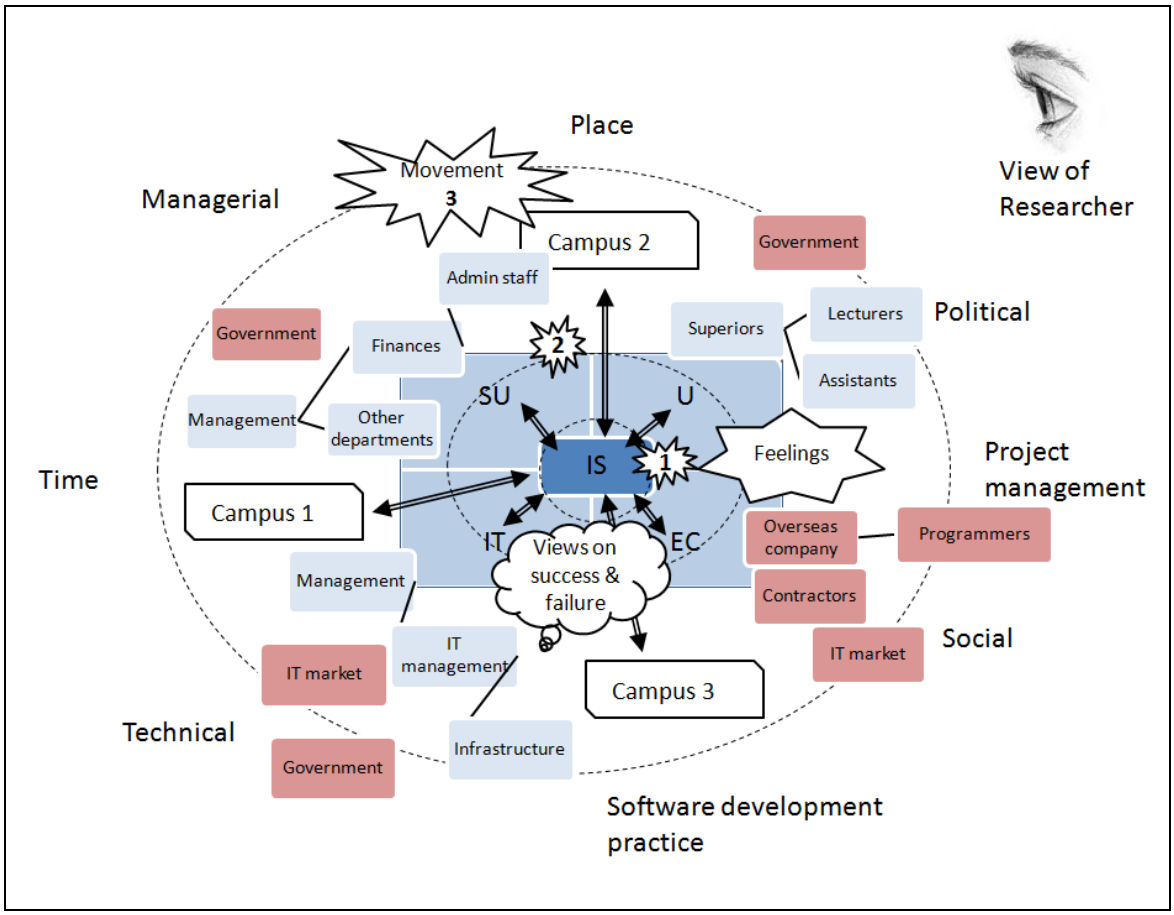

Figure 7.4 Complexity of the IS and the environment – researcher's view (own construction)

Each of the stakeholders have their own perspectives of what went wrong in the past or what constituted failure, what is working well currently and what is required for a successful system in future.

The analysis also indicated feelings such as attachment of the stakeholders towards the system.

They also revealed elements or factors that force change in the system or company.

In this study story was used to convey and share these perspectives with the researcher. Stakeholders' meta-narratives emerged from the analyses. The usefulness of the three approaches was discussed above presenting numerous meaningful aspects that are of value and add to practical significance internally within organisations, in the IS development field as well as in the research methodology realm. All these aspects emerged and were drawn from the stakeholders' accounts by applying the multi-lens of three narrative approaches.

The next section describes the contribution of this study.

7.4 Contribution

The contribution of this study was on different levels.

The contribution of this study is firstly the methodology that was used. Narrative approaches have successfully been utilized in this study in IS research accentuating the need and importance of borrowing from other sciences. The methodology in this study is novel in the sense that narrative approaches that are more commonly used in the social science domain have been applied in the information system field. It was applied successfully as presented in chapters 4-6. The strategy followed for this study in order to focus in on deeper aspects of the IS and stakeholders is relatively new. Tracing of elements from the three narrative approaches or viewpoints throughout the accounts of stakeholders is a method in itself. This was done in order to obtain a fuller picture of what happened (retrospective), how the IS stakeholders cope in the now (living story) and what lies ahead in future and connect it with living story (antenarrative). This rich data could not have been possible with common case study research.

It is unusual to obtain the depth available through the combination of different methods, even within the social sciences. For this study the methodological aspects that were used as sensemaking devices by using a multi-perspective-lens are presented in table 7.7. The table constructs the various elements emphasising the richness of insights obtained through the use of multiple approaches. These elements can be used by IS developers to guide them when analysing accounts of stakeholders of new systems. Developers and managers can in a narrative way listen to users – ask them to share their concerns on pervious IS, discuss current problems and what they would appreciate in future developments. Although the stories for this case resulted in many pages of text, developers can use appropriate extracts of the accounts of users, making sure they include all levels of users. Elements from the three approaches as they were used and identified in this study are therefore highlighted in table 7.7 building on the initial framework as indicated in Table 2.5. This can be used as guidelines in storytelling and narrative analysis.

Another contribution of this study is in the field of narrative. A scientific field has been studied by a non-traditional research method for this discipline. The subject of information systems has been brought into the narrative domain. Insightful results have been obtained. Multi-voiced, context rich results were discovered by utilising a narrative approach in IS research. Interesting use of language was seen from analysing the accounts of stakeholders. Relationships have been discovered between stakeholders, the information system and environment. Spatial, temporal and interdependency elements have emerged.

The contribution to IS failure research is that a fuller picture was established of IS failures, their dynamics, interactions and multiple perspectives of stakeholders on issues such as success and failure. Indeed, there appears very little evidence of similar comparative work and the findings are of interest to the narrative community, as well as to the IS community for the insights that are on offer.

Aspects / features of approach ⇩	**Classical approaches**	**Post-classical approaches**	
Theory	**Narrative**	**Living story**	**Antenarrative**
Main focus	Retrospective Beginning-middle-end (BME) plot	Now and here Multi-plotted, changing	Before coherence, Prospective, future
Form	Linear	Non-linear	Cyclic, spiral
Main objective	Identify story elements, structure	Identify livingness, webs of story-to-story	Between processes, how lived experience is shaped, Identify future elements
Movement	Structural, static , fossilized	Movement, changing	Multiplotted, Morphing as contexts shift, Prediction
Perspective	Mono-voiced	Multi-voiced	Multi-voiced, marginalised voices
Deliverables	Categories, proper story, structure	Narrative in context, Understanding interactions in time and space, Learn lessons	Bigger comprehensive picture, Complexity, Making sense prospectively, Connect and bridge narrative and living story, microstoria
Features/elements	Other narrative elements and patterns – such as those used in literary theory, Content analysis, Themes, Categories, Concepts, Characters, actors, Time, Place, Events, Linguistic structures, Order	Contextual Unfolding Co-created Interdependency Intra-organisational Dynamic, Microstoria, Read between the lines, Power struggles – politics, Characterisation, Little story elements, Point of view	Contextual Incoherent Fragments Non-linear Collective Unplotted Pre-narrative, Speculation, Improper story, Moving patterns, Unfinished, Shaping possibility for the future

Table 7.7 Multi-perspective framework for analysing stakeholders' accounts (Own construction - adapted from Boje, 2011; other sources: Bal, 1991, Boje, 2014, Clandinin & Connelly, 2000, Du Plooy, 1986; Riesman 1993, Rosile *et al*., 2013)

Another contribution has been accomplished in the area of information system practice. Different factors crucial to the understanding of IS and how they are perceived to succeed or fail have emerged from the accounts of stakeholders – internally and externally. The one factor

for success that is shared between all stakeholders as it emerged from analysing their account is user satisfaction (from table 7.2).

Stakeholder groups	Super Users	Users	IT	EC
Shared success factor				
User satisfaction	X	X	X	X

Table 7.8 Shared success factor

The one factor for IS failure that emerged between all stakeholder groups' accounts was communication (from table 7.3).

Stakeholder groups	Super Users	Users	IT	EC
Shared failure factor				
Communication	X	X	X	X

Table 7.9 Shared failure factor

It can be seen that both these shared factors are not of a technical nature. This result confirms that people issues are very important for successful system as it is indicated in chapter 2 in the literature study of failure and success. These views may influence the way successful and failed information systems are defined. It has been shown in this study that different role-players have different perspectives on success and failure within IS. Tables 7.2 and 7.3 and the discussion thereof is indicative of these differences and similarities. Another issue that came forth was that of adaption. All stakeholders had to make plans in order to cope with everyday problems in that not all problems can be corrected when needed. Indeed some issues will never be solved and stakeholders must live with the problem or work around it.

Ultimately this study has shown how IS failures or failed aspects within IS can be better understood when using narrative analysis which were not possible with post project evaluations.

Through analysing and interpreting the accounts of stakeholders it emerged that numerous lessons were learnt by stakeholders as how to improve future endeavours such as this IS. Table 7.5 listed solutions offered by stakeholders to handle their problems with the IS. List 7.4 suggested guidelines for IS development and practice that emerged from the stakeholders analysed accounts. List 7.4 also demonstrated that all stakeholders' views and needs should be taken into account to make sure all needs are met and small voices are heard as well. All stakeholders have significant things to say and contribute to future successes. This was an important lesson.

The concept of narrative can be brought into the "tool box" of IS practice when systems are planned, developed, implemented, evaluated and maintained. Taking into account different elements that emerge through the analysis of stakeholders' stories through a narrative and antenarrative lens, a more comprehensive view of needs and requirements can be obtained. In doing so a more acceptable or useable IS may be developed. The value of using narrative analysis during any phase of the development of an IS can positively influence the way

problems are solved and changes are incorporated in an information system. This can be of use for internal learning within organisations as well as external learning by the discipline. Although this case history resulted in many hours of transcription of interviews, developers analysing the stories of stakeholders can use the framework in order to pull out the applicable experts and concentrate their efforts. Further research is needed in order to ascertain how practitioners can apply narratives and storytelling when developing systems.

The following section concludes this chapter.

7.5 Conclusions

This chapter presented a summary of findings when classical and post-classical narrative approaches were applied to analyse the accounts of IS stakeholders' experiences. The classical narrative approach was useful to identify characters, plots and look for beginning, middle and end in their stories. Certain main themes emerged from each stakeholder group. It was evident that their outlook differed on what they considered to be contributing to success and failure within IS. The theory of living story offered richer insight into this phenomenon of stakeholders' experiences of their involvement with an information system. Multi-voices were heard, cycles of coping with changes and challenges were identified, interdependency between systems and role-players were recognised. The small voices were heard and acknowledged. By using antenarrative theory is was possible to identify prospectiveness that was articulated by the stakeholders throughout their accounts.

It was seen that the contribution of this research resides in at least three areas. Firstly, the methodology realm used to investigate information systems failures was enriched by applying this combined research strategy in the study of the accounts of IS stakeholders (Table 7.7). Secondly, narrative theory was used in a new application area which yielded deep insight into the phenomenon where a meta-narrative from all the stakeholders involved emerged (Figures 7.3 - 7.4, Tables 7.1 - 7.6, Lists 7.1 - 7.3). Thirdly, information system practice was offered guidelines (List 7.4) for future developments stemming from the experiences of these IS stakeholders, giving them the opportunity to raise their sometimes "soft" but crucial voices in order to construct improved or more successful information systems. In this way narratives can help address the issue of IS failure in that a deeper insight is gained into problematic aspects within IS development and use. The contribution to IS failure through storytelling is shown in Tables 7.8 -7.9. These results indicates the views of the stakeholders on success and failure thereby showing how storytelling and narrative analysis can help in focusing on these factors taking into consideration the multiple views of the different user groups.

Chapter 8 presents a summary and final conclusion of this study.

Chapter 8 Conclusions, contributions and future work

8.1 Introduction

The problem this research addressed was the following:

> *Most current post project evaluations attempting to make sense of IS failures do not take into account all the stakeholders' experiences in order to understand the IS failure phenomenon*.

A key theme of this study was the importation of narrative methods from other subject areas (e.g. social sciences), as an alternative approach, to be used in understanding and making sense of IS failures. This is needed to improve the IS failure situation. In particular, the stakeholders' stories and their experiences of IS failure situations as shared with the researcher were investigated. This gave insight into the complex, multi-voiced scenarios that unfold that would be useful to future IS practitioners in understanding the complex human dimension of IS projects in order to improve future IS development.

This research introduced an innovative approach to address the problem of understanding information system failures. Numerous errors and problematic situations are faced by stakeholders when developing and using information systems. The literature review showed that current methods to make sense from IS failures have not been effective in addressing the problems. This research was planned to explore narrative approaches in the IS domain where failures are experienced. Narrative theory was investigated for feasibility of importing it from the social sciences to the IS discipline. In this respect the study is original and used innovative approaches to make sense of stakeholders' experiences with the IS. This study has in this way contributed to the methodology and approaches used in the investigation of IS failures, with a specific focus on learning from mistakes using the experiences of stakeholders whilst taking into account their multiple perspectives.

This chapter presents concluding remarks on this study – summarizing the research journey, looking back to what has been done, how the work has contributed to the IS body of knowledge, and glancing forwards to indicate possible future work.

8.2 Looking back

When reflecting back on this study the main research question stated in chapter 1 is repeated as:

> *How can narrative analysis methods be useful to make sense of IS users' experiences in information systems failures?*

This study was guided by five objectives in order to answer the research question. The next five sub sections indicate how and where the objectives of this study were reached.

> *1. To present the current status of IS failures by providing background on the phenomena.*

Chapter 2 introduced the topic of IS failure. Examples of failures were given to show they are still regularly experienced in practice. From the review of the literature, factors contributing to

failure, as well as ways to improve the situation were discussed to emphasise what has been done to address IS software problems. It was seen that proposals and methods to address problems in IS and to investigate failures are not solving the problem. Some researchers anticipated more interpretive approaches and deeper investigative methods were needed in order to take into account the context and variety of factors when investigating IS failure.

2. To present current approaches for investigating IS failures.

Chapter 2 addressed the issue of how IS failures are being investigated and how post-project reviews are used to learn from completed projects. It was however shown that the IS community still lacked proper learning approaches and feedback from stakeholders was still not adequate. The incidence of failure was still apparent and therefore it was still necessary to investigate approaches that could make sense from failed IS situations in order to improve on future practice. The research suggested using narrative approaches for exploring the experiences of stakeholders in an IS. Narrative was recommended for the reason that it gave the stakeholders an opportunity to raise their voices, and an opportunity to take the context into account. Indeed, narrative reached deeper than current post-project reviews.

3. To provide a clearer understanding of narrative approaches that could be used for investigating experiences of IS users and their perspectives.

Chapter 2 presented background information on narrative analysis approaches. A short history was presented in order to observe where narrative had originated. It was seen that there was movement from structured and classical narrative inquiry approaches towards post-classical methods that allow deeper insight into the phenomenon under investigation. The strong linear construct of beginning-middle-end had been liberated in order to move towards contextual, relational and dynamic, inter-dependency foci. It this way the event / incident under investigation could be understood more comprehensively.

4. To apply narrative approaches to a specific IS and uncover the stories of the different user groups regarding their experiences of the system.

Chapters 4, 5, and 6 presented the analysis of the accounts of IS stakeholders using three narrative approaches. Firstly, retrospective narrative analysis was performed on the accounts of the stakeholders. Excerpts from the stakeholders' accounts were identified where beginning-middle-end fragments were used. Elements of time, place and character could be analysed and prevailing themes emerged from the different user groups. Chapter 4 presented the analysis of the accounts from a retrospective viewpoint as a classical narrative approach.

Secondly, a living story analysis was conducted as described in chapter 5. The accounts of stakeholders were used to identify the livingness of their stories and the IS they were talking about. Rich insight was gained by the researcher as interrelatedness amongst stakeholders accounts were seen, movement and dynamics of the IS were identified, feelings towards the system were revealed and contextual issues became apparent. The different groups accentuated issues from this information system from different perspectives. This indicated the multi-plottedness of the situation under assessment. Dominant views that came forth from their account included aspects such as failure, success, problems, solutions and pride showing the complex dynamics of interactions between such items.

Thirdly, the accounts were viewed through an antenarrative approach in chapter 6. There were references to prediction and future prospectiveness in the accounts of stakeholders from this IS. It was evident how the environment had changed and the system was morphing with it (including the stakeholders). The users have a typically smaller voice in this environment but it was seen how important it was to listen to the small stories also in order to ascertain the real needs on ground level. The dynamics of the system appeared and it was extracted from the accounts that it will inevitably influence the future of the system and the stakeholders' interaction with it. The usefulness of placing the accounts of stakeholders under an antenarrative investigative lens was shown in chapter 6.

5. To assess the usefulness of narrative approaches in the IS failure field and propose alternative ways to make sense of IS failures

It was shown in chapter 4, 5 and 6 how narrative analysis was conducted using the accounts of the IS stakeholders from classical and post-classical approaches. Insightful and interesting themes emerged from the data. Chapter 7 pulled the findings together and presented lists of elements and issues that emerged as dominant as perceived by the different groups of stakeholders.

When evaluating the classical approach where retrospective narrative analysis was conducted it appeared useful in that insight was gained into the stakeholders' experience and involvement with the information system. Their involvement stretched over all the phases of the development life cycle. Characters were identified; certain themes and topics emerged from analysing their accounts. Very often they referred to problems they encountered with the system. In this way future IS developments can be using these insights to learn from mistakes. Interesting use of language was also noted that can be of concern for narrative researchers. Although it was interesting to analyse their accounts in a structural, more traditional way there was a lack of depth and richness. The next two approaches that were applied were post-classical of nature.

Living story and antenarrative theory were subsequently used as sensemaking devices to analyse the IS stakeholders' accounts. Dynamic, non-linear and multi-voiced properties were identified in the stories of the stakeholders when applying a living story approach. The interrelatedness of the stakeholders' accounts was evident in small fragments from the different 'stories. It was apparent that accounts could not be fitted in linear structures of proper narrative. The environment and system were experienced as dynamic and changing as certain forces from within and externally drove the changes. It was seen that all stakeholders had to adapt in order to effectively use the IS. Small stories as well as official stories were shared. Certain dominant areas were highlighted repeatedly such as failure and success aspects, solutions proposed by the stakeholders, characterization and specific factors to consider when designing and developing a new system. When looking with an antenarrative lens there was prospectiveness evident in the accounts where users referred to the future and hinted at what they would like in new information systems. By following these approaches it was useful to see how rich the accounts were when identifying elements and aspects by exploring the accounts with a deeper looking tool. This could not have been possible with a retrospective narrative approach. Specific lessons came forth from the excerpts of the

stakeholders in order to enhance future software development endeavours. Specific guidelines were offered in chapter 7. Developers can use these approaches to learn from previous IS projects to incorporate stakeholders and their stories' analyses in their preparation for new information systems. Users and organisations themselves can use storytelling to make sense from IS failures.

These five objectives have been met and thereby answered the research question stated:

> *How can narrative analysis methods be useful to make sense of IS users' experiences in information systems failures?*

The aim of the study was achieved by showing that a multiple lens of narrative methods can help to make sense and understand the complex IS failure phenomena thereby supporting practically in future IS development endeavours.

8.2.1 Publications and conference presentations stemming from this research

As part of establishing validity of process and results and in order to confirm the nature and quality of this research - conferences were attended and papers were presented to different academic communities. Two chapters in books were published and a journal paper was published. The feedback and comments from the reviewers and peers were taken into account by the researcher to further enhance the quality of this work.

Conference presentations and peer reviewed publications in proceedings

- Dalcher, D. & **Drevin, L.** 2003. *Learning from Information Systems failures by using narrative and ante-narrative methods.* SAICSIT 2003, Fourways, Johannesburg. 17-19 Sept (In Eloff, J., Kotze, P., Engelbrecht, A., and Eloff, M. eds. IT Research in development countries. Proceedings of SAICSIT 2003: A Volume in the ACM international conference proceedings series ISBN: 1-58113-774-5, p 137-142. South Africa.
- **Drevin, L.** 2009. *Making sense of Information systems (IS) failures by using narrative analysis methods,* in Proceedings of the 13th and 14th Annual Working Conference of CPTS (*The Centre for Philosophy, Technology and Social systems)* ISBN 987-90-807718-6-4, p 131-143. Presented the paper in March 2008, Maarssen, Netherlands.
- **Drevin, L.** & Dalcher, D. 2010. *Using antenarrative approaches to investigate the perceptions of Information Systems' actors regarding failure and success.* ISD – 19th International Conference in Information Systems Development. Prague, Czech Republic, Aug 25-27 2010.
- **Drevin, L.** & Dalcher, D. 2011. *Narrative methods: Success and failure stories of Information System users.* Proceedings of the Standing Conference for Management and Organization Inquiry (sc'MOI 2011), ISBN: 0-9778135-6-8, p 69-82, Philadelphia, PA, USA.

Chapters in books – peer reviewed

- **Drevin, Lynette** & Dalcher, Darren. 2011. *Antenarrative and narrative: The Experiences of Actors Involved in the Development and Use of Information Systems*, in Storytelling and the Future of Organizations: An Antenarrative Handbook. Edited by David M. Boje. ISBN: 978-0-415-87391-8, p 148-162, Routledge, New York.

- **Drevin, Lynette** & Dalcher, Darren. 2011. *Using antenarrative approaches to investigate the perceptions of Information Systems' actors regarding failure and success,* in "Information Systems Development Business Systems and Services: Modeling and Development" Edited by J Pokorny, V Repa, K, Richta, W Wojtkowski, H Linger, C Barry & M Lang. ISBN: 978-1-4419-9645-9, p 207-218, Springer, New York.

Journal article – peer reviewed

- Dalcher, D. & **Drevin, L**. 2004. *Learning from information systems failures by using narrative and ante-narrative methods*, in: South African Computer Journal, Issue 33, Dec Published: 2004 SACJ nr 33, ISBN 1015-7999, p 88-97.

These publications also support the verification of the research process, methods and results. These outputs were presented to and published in the IS community, philosophy and methodology community as well as within the narrative discipline.

8.2.2 Trustworthiness and plausibility

In order to obtain trustworthiness and plausibility (Oates, 2006) this study was guided by a roadmap for research. A framework (research onion, Saunders *et al*., 2003) was used to position the research methods and design. Furthermore the research was documented and presented in this thesis as well as in peer-reviewed publications. A "genuine" attempt was made to understand stakeholders in their particular setting - IS environment (Oates, 2006). Plausibility was achieved by analysing and interpreting the data using evidence as generated by the stakeholders through their narrative accounts. Chapter 3 also discussed guidelines that were applied in this study for rigour and trustworthiness.

The fact that the same case was analysed three times with different groups of participants, albeit whilst utilising different methods, provides additional validation and confidence in the results, as significant research is normally unable to provide additional verification through multiple studies of the same phenomena. Moreover, typically such studies would be carried out until saturation was reached in terms of findings; having reached parallel saturation three times, the researcher has added confidence in the findings derived through the research design.

Next, limitations encountered in this study are presented.

8.3 Limitations of the study – retrospect

As stated in chapter 1 the limitations in this study were initially related to the choice of narrative analysis methods. The numerous ways narrative work was defined, conducted and published made it difficult to select and apply narrative approaches. Indeed, it was also impossible to cover the entire spectrum of narrative approaches. Therefore three broad approaches which represent the many strands of narrative analysis were utilised including classical and post-classical narrative approaches. In this way the IS discipline could benefit from a range of different types of new approaches for investigating IS failure.

Another issue that needs mentioning is the fact that only one case history was investigated. This may lead to questions about the generalisability of the results. This work was done in an

interpretive way and therefore the aim of the study is to understand the phenomenon and not necessarily to generalise for all information systems. Merriam (1998) discusses this issue of external validity or generalisability in qualitative studies and how it differs from the scientific method. She refers to Erickson who contends that the aim of interpretive work is not to derive generalisable knowledge. A specific case is studied in depth to get "*concrete universals*". The strategy of providing a "*rich*" and "*thick description*" is offered by Merriam (1998) to provide readers with enough detail to be able to conclude whether research findings can be transferred to other situations. This transferability is also confirmed by Lincoln and Guba (in Oates, 2006:294). Gummeson (2000) also adds to this debate asserting that case study research in management is increasingly used as an accepted scientific tool. In-depth understanding of a phenomenon, for example the mechanisms of change - is reached without studying many cases. Even one case may be sufficient to make certain general statements in a social setting and the question is even asked if it is meaningful to generalise in a social context? The term particularisation is sometimes used to show that the aim is to understand a specific situation. It is important to note that the search for new knowledge is never completed, and the claim that the ultimate truth is found should not be made. In this way the demand to generalise is then not so urgent. However, the literature supports many of the findings reached in this study as shown in chapter 7. For example - aspects of success and failure identified in this IS correlate with what is presented in chapter 2 as part the literature overview. The aim of understanding the experiences of IS users by applying narrative methods was successfully reached. Rich, valuable insights were gained which may be applied to other IS developments (e.g. List 7.4). It was also part of the research design that stakeholders from all the different groups associated with the IS would take part in this study in order to incorporate as wide as possible view on the IS. In this study certain narrative approaches were tested and the application of these methods is generalisable and transferable to future research efforts.

Another issue that was part of the study journey was the interdisciplinary nature of this study. The researcher had to learn a new discipline – not traditionally part of IS curriculum, content and methods. Use of a variety of narrative literature sources, visits to and discussions with experts in the narrative field and trial and error were all part of the journey.

The way of documenting the findings was also not clear from the start. The quantity of interview data was enormous as transcribed to textual data. The choice of presenting the analyses of the stakeholders' accounts as examples and interpretation per person per group and then a summary per group was made to indicate the issues each group shared about their IS experiences (chapters 4-6 and the appendices). It was decided to present the findings in table or list format per group of stakeholders (chapter 7). This was the most concise way of doing it together with a discussion.

Often the question of subjectivity is raised when qualitative work is done. According to Duncker (2003) "*qualitative work is not more subjective than other forms of research*". A similar issue that may be raised is that of potential contamination and bias. The same researcher conducted all the interviews for the three methods of analysis. The researcher however took precautions in order to avoid bias. She was aware and mindful about this possibility. The interviews were analysed and interpreted during different times. It was as if a different set of lenses were put on for each approach -focusing on the elements and features

of each method. Only during another timeframe the next approach was applied. A strength of the research in doing the analysis in this way – one case setting – is that the researcher could observe how each analysis approach fared and what insights each of them evoked. The researcher could ensure that the methods were applied systematically. It was also not practical to do three investigations. This one setting was already generating a huge amount of data to be analysed. Another problem when three cases were to be studied is that their non-relatedness would make them incomparable. The researcher ensured in this way that the focus was observed at all times.

The contribution and value of this research are presented in the next section.

8.4 Lessons learnt – contributions revisited

The contribution of this research was discussed in chapter 7. The findings of this study support the thesis statement that:

Narrative analysis methods can be useful to make sense of IS failure.

However there was more to discover. Not only was it seen that specific aspects for software development came forth from the stakeholders stories, but also other contributions emerged. The contribution of this study is therefore on several levels and areas. This is summarized in the next three sections as already discussed broader in section 7.4.

8.4.1 IS Research methods

The main contribution is to the sphere of information systems research methodology. There was a need to enhance research methods when problematic situations in IS were investigated in order to improve understanding of IS failure. The research design for this study comprised of classical and post-classical narrative approaches applied iteratively to the accounts of IS stakeholders. This methodology that was devised by the researcher drawing upon narrative and antenarrative theory was novel in the sense that narrative approaches originally from the social sciences have been applied in the information system field. This put emphasis on the importance to borrow from other sciences when needed. There was a problem in the IS field and current methods were not solving the problem. The researcher searched for approaches elsewhere. Narrative was brought into the IS domain. The retrospective narrative, living story and antenarrative approaches were applied successfully as indicated in chapters 4-6 all revealing different aspects of the experiences of stakeholders. Table 7.7 was presented to indicate the elements in the multi-perspective–lens that was applied in this study. This method can be applied and tested in other research projects.

8.4.2 Narrative theory and practice

The benefit for narrative theory is that a new subject area was introduced, namely information systems aspects including IS development and use and IS failure. This study borrowed from the narrative domain and the results from this study are giving back to the discipline it borrowed from. A meta-narrative emerged from all the stakeholders and their interaction with the system. The implication for narrative practice is that different narrative approaches can be useful for analysing accounts of stakeholders of non-traditional narrative studies broadening up research fields. In this case IS failures were brought into scope. The result of analysing the

stories of IS stakeholders narratively is a fuller picture with context and movement of the phenomenon under investigation. This is also a contribution to IS. When evaluating the usefulness of narrative in IS it was discovered that there were multiple roles of story. Stakeholders made sense from what happened in the past through their accounts. They shared how they cope with daily challenges and they sometimes offered solutions. They reflected on how things were changing and how they predict things will be in future. Storytelling was employed to achieve this looking back, sharing their ways of coping and looking forward to steer into future. Storytelling was also a means to convey interpersonal values and viewpoints. They expressed feelings toward the system. Stakeholders used stories to represent their logical outlook on their work practices. Why they did things the way they did. How they coped with daily challenges. How they planned the way forward. Official stories were augmented by the small stories as to give a more collective view of the IS and its environment and role-players. Interesting metaphors and analogies were used at times – this can be further studied in a literature context. Tables 7.1 – 7.6 and lists 7.1 – 7.3 presented these contributions.

8.4.3 Information system practice

Traditional post-project assessments do not convey in-depth and rich insights into IS stakeholders experiences. The benefit gained when using a narrative lens was that the views and perceptions on the IS of different stakeholder groups can be taken into account when trying to understand the complexities and challenges of the system. Thus another contribution was in the area of information system practice. IS development can learn from the IS stakeholders taking into account their experiences of the past and the present and their views on future systems. Chapter 7 has offered guidelines specific to IS development to be taken into account for future IS developments. The different groups of stakeholders shared their perceptions on success and failure within IS. Tables 7.2 and 7.3 indicated this. It was seen in chapter 7 that the common factor all stakeholders shared about IS failure was communication and the shared success factor was user satisfaction. Therefore it is necessary to share these views, listen to all the stakeholders to be able to adhere to their needs and better identifying problem areas. Everyone has important things to say and contribute to future successes – also the stakeholders with traditionally small voices. In doing so it is hoped that future development efforts will be an improvement of the current situation and that narrative can contribute to eradicate IS failure and misunderstandings thereby lowering the rate of IS failure currently experienced. List 7.7 presented guiding principles for IS development that came forth from this case history using narrative analysis. IS developers can use narrative and antenarrative approaches to analyse stories from stakeholders regarding previous or current information systems using the elements from the multi-perspective framework presented in table 7.7. In this way they can use the findings from the analyses from previous IS projects to take into account for future developments. This enables them to understand the context-specific issues, environment, complexities, problematics, preferences, interpersonal relations, take into account the marginalized voices' and their issues, understanding the past problems, current issues and future expectations, etc. Narrative methods can be useful for internal learning within organisations as well.

In sum – narrative and antenarrative methods can help to retrospectively identify aspects that are important to all IS stakeholders. IS development practise can analyse and use the

experiences of all levels of stakeholders for future IS projects, hopefully improving the IS failure situation. Dominant and small stories are important, multiple and different perceptions, looking back, looking at what currently is going on and how users cope and looking into the future, how can things be done differently next time – it all matters.

The next section presents possible future work.

8.5 Looking forward

Whilst this study has been conducted proposals for further work emerged.

Although a few approaches for analysing narrative accounts were considered for this study three broad approaches were ultimately applied representing the main streams of doing narrative analysis. There were other methods that could have be examined for usefulness to address the research questions in this study such as discourse analysis and grounded theory.

At some stage of this study the thought came to mind to consider the use of software for the analysis of stakeholders' accounts. ATLAS ti was reviewed as a possible qualitative software package. This could be considered in future research projects and be compared with the current way of work.

The area of digital humanities where big data sets are used can be explored with storytelling and narrative approaches.

The application area of information systems was used in this study; however other domains can also be included in such a study, for example information security incidents, social engineering attacks etc. This study can also be done when success is the focus in IS rather than problems and failed situations in order to learn what was done correctly to further strengthen these aspects.

Other companies with problematic situations within their systems or where regular change is apparent can similarly use narrative approaches to investigate these phenomena.

It was shown in this study that rich insight in the problematic situation can be observed and that lessons can be produced by the stakeholders in order to learn from past incidents. Therefore the approach utilised and devised in this study can be applied in a broader sense in organisations. This can also be used to augment other investigative approaches already in use.

It was not the intent of this study to develop a general and comprehensive model of an information system with the aspects that emerged from analysing the stakeholders' accounts. Figure 7.2 attempted to indicate the complexity and factors influencing this particular IS. It would however be interesting for future work to look into a more general model to include as many aspects and elements as possible for developers to take into account when planning a future system. As was seen in this study, aspects such as feelings, attachment, pride, offering solutions, context, different views on failure and success, etc. emerged from the accounts – apart from technological issues. If all this can converge in a model of "Sociology and Psychology of Information Systems" it would be a step forward for IS development to improve success in information systems when the human issues and context are better understood and incorporated in IS development practices. In this - narrative and antenarrative methods can

provide a crucial role in understanding what stakeholders need – inside and outside an organisation.

The next section brings this study to a close.

8.6 Conclusions

How can narrative analysis methods be useful to make sense of IS users' experiences in information systems failures?

The answer for this research question stated in chapter 1 was obtained in this study by applying a multi-perspective narrative lens to the accounts of IS stakeholders. It was indicated by applying different narrative analysis approaches that a better understanding of problem areas within an IS could be obtained getting multiple views of stakeholders that normally would not have been possible through traditional post-project reviews and assessments.

In section 1.4 the thesis statement of this research stemming from the problem description and background discussion was:

Narrative analysis methods can be useful to make sense of IS failures.

The above statement was investigated in this study. The evaluation of the usefulness of the narrative approaches applied in this study (section 7.3) indicated the value and practical worth of these methods. It can be applied during development and use of an IS internally within an organisation as well as externally by the IS development field.

It is therefore demonstrated in this study that applying narrative analysis methods utilising a three dimensional lens is useful in making sense of IS failures.

How is the IS field different?

With this work done it is demonstrated that the IS discipline can include and listen to the under-represented voices when new IS developments are undertaken in order to enthuse and empower IS stakeholders on all levels – internally and externally. Looking back at previous IS endeavours stakeholders can share their experiences of what went wrong before a new IS is planned and developed. Sharing their stories and ideas about their current IS can also be useful for developers and system analysts. Reflecting on future IS possibilities might also be useful to developers to gain a better understanding of stakeholders' perspectives on IS and their future needs and the complexity of systems.

Narrative analysis can help in a pre- and post-project way. It was shown in this work how narrative and antenarrative methods can contribute to this and hopefully result in less IS failures and with more satisfied IS users. Information systems continue to influence an ever growing portion of our lives. Therefore our insight of the problems and challenges related to IS development and use depend on our ability to make sense of all involved IS stakeholders' stories. However, sensemaking is ongoing and people are always in the middle of things (Weick, 1995).

To finally conclude this research on storytelling in information systems failures - quotations of stakeholders in this study are used to indicate the richness of accounts – that would not have been possible to explore with other research methods. These excerpts are presented as a tribute to all the stakeholders that participated in this study.

These excerpts speak for themselves and show the livingness of storytelling:

"You see, it was terrible when we rolled over from the old system to the new one. Do you remember that they loaded a new version, and a new version, about every second day, and just as one thing was fixed another would stop working? That was the biggest complaint."

"I think an error that we made there was, the system is too big to think that you can specify everything now – at once."

"But it is your system, nearly like a mother over her baby; I do not want to hear anybody speak badly about it because we work very hard at getting it right."

"We IT people, not that we are completely IT driven (laugh), we just are not very good at communication."

"But it is still the story of fixing one thing, and then another doesn't work."

"I think they didn't test it long enough before they… but now we are the guinea pigs, the testers."

"I think it is a very nice system in the sense that… it actually does too much."

"We are one of the leading companies with this technology."

"If they are happy then we know our whole system is happy."

"Okay so there is definitely a big lesson to be learnt. You, it is not just the case where you can sit and build the system. You must think and plan the bottom layer that is going to make life much easier."

"Because the back and forth between two systems was very challenging. Grey hair, you see?"

"They do not see the bigger picture..."

"People struggle to accept change – this is something I learned in textbooks, and now I experience it – more than once it happened."

"But people are terrible after a while, in a comfort zone" "It is the changes than can confuse one."

"Work again on such as system: Then I take my bag and run"

"Then they could look at the system's flexibility"

"Technology is moving at such a great pace"

"Some you win, some you lose, no matter what you build in, some you win, some you lose, and this is how it is..."

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Appendix 1 Causes of IS failures

Table A1 presents factors and or causes for failures from different studies. The first column indicates the authors and what each study focused on. The next column indicates the factors and causes of failure. The third column presents interpretation or notes where applicable. The topics in the highlighted rows indicate the main focus/category/context that each study had.

Author/study Focus on:	**Factors/causes of failures/ characteristics**	**Notes**
	General list of factors	
Glass (1998) 6 Characteristics for projects likely to fail	1. Project objectives not fully specified. 2. Technology new to the organisation. 3. Inadequate or no project management methodology. 4. Insufficient senior staff on the team. 5. Poor performance by suppliers of hardware and/or software. 6. Bad planning and estimation.	Technology and management may contribute to failures
Bentley & Whitten (2007), May (1998) Causes of failures	1. Failure to establish upper management commitment to the project. 2. Lack of organisations' commitment to a systems development methodology. 3. Taking shortcuts around the development methodology. 4. Poor expectation management. 5. Poor estimation techniques. 6. Inadequate people management skills. 7. Failure to adapt to business change. 8. Failure to plan and manage the plan. 9. Poor user input. 10.Stakeholder conflicts (echoed by Warne, 2003). 11.Vague requirements. 12.Skills that do not match the job. 13.Hidden costs of going 'mean and lean' – expecting the same work with less resources. 14.Communication breakdowns. 15.Poor architecture: developers should plan for future changes. 16.Late failure warning signals.	Failures have been documented for many years, but they still keep cropping up
	Size and complexity	
Nelson & Ravichandran (2001, 2004)	Large-scale IT/IS projects have higher failure rates than smaller IT projects	The classification of size is implied by a higher complexity degree (which includes among others size of data sets and programs) and the amount of resources that is required to implement the system.
Royal Academy of Engineering (2004),	Complex IT projects - it is impossible to understand and predict the behaviour of	Propose agile and 'evolutionary project

Gilb (1988)	complex systems at the beginning of a project	management' concepts such as rapid feedback, greater user involvement and dynamic development
Project management practices and views on risk		
Kanter & Walsh (2004) Causes of failure according to workshop participants Recommendations by workshop participants	1. Lack of communication. 2. Schedules that are unreasonable. 3. Lack of appropriate skills. 4. Inadequate design. 5. Incomplete requirements. 6. Ineffective project leadership. 7. Inadequate initial plan. 1. Define functional requirements and control changes. 2. Define realistic project schedules. 3. Get the right people at the right time. 4. Get honest feedback on the status of the project. 5. Establish a baseline and control the performance of the contractors.	Consultants were asked to help improve software development practices and they employed a workshop method to achieve this. After the workshops were held and the findings were discussed, better communication and improved understanding resulted between stakeholders
Muller (2003)	Communication aspects	
Keil *et al.* (1998) Identify risk factors contributing to failures	1. Lack of top management commitment to the project. 2. Failure to gain user commitment. 3. Requirements not well understood. 4. Inadequate user involvement. 5. Failure to manage the expectation of users. 6. Changing scope. 7. Lack of skills. 8. New technology. 9. Insufficient staffing.	
Evans *et al*. (2002). Use the terms dysfunctional software instead of failures Seven predominant characteristics emerged from a risks database over twelve years relating to common IS failures.	1. Failure to apply essential project management practices. 2. Unrealistic management expectations. 3. Not applying effective software practices. 4. Premature victory declarations. 5. Lack of management leadership. 6. Untimely decision making. 7. Lack of pro-active risk management.	Many of these issues are known but project members are sometimes in denial when disaster indicators emerge – resulting in poor decisions being made. All of the above seven characteristics are cultural rather than technical issues and they point out that this fact is also a reason for the failure situation.
Categorisation of failure reasons and factors		
Yardley (2002) Classify factors	1. Technical failure, for example poor technical design. 2. Human failure, for example stakeholder	We are too trusting in processes and project management

	conflict. 3. Process failure, for example insufficient testing.	approaches and we need to be aware of additional factors that influence the outcome of IS projects.
Lyytinen & Hirschheim (1987) Young (2005)	1. Features of the information systems where the technical and data domains are implied. 2. Features of the IS environment. This covers the user and organisational domains. 3. Features of the IS development process which deals with recognizable aspects of the development process as well as processes, methods and the organisation. 4. Features of the IS development environment. The larger societal and cultural environment is covered here.	The stakeholders' reasons and their intention around the IS must be understood. They do not believe that a simple, straightforward explanation of a failure will be possible.
Ewusi-Mensah (2003)	1. Socio-organisational factors that include unrealistic project goals, changing requirements, lack of executive support and commitment and insufficient user involvement. 2. Socio-technical factors that comprise of unrealistic project goals, project control and management problems, inadequate technical expertise and changing requirements. 3. Economic factors where cost overruns and schedule problems are experienced and unrealistic goals and changing requirements occur.	This reference shows that these factors can occur at any stage of the software development process. It is noted that some of the factors e.g. unrealistic project goals and changing requirements, belong to more than one category.
Nuss (2004) Internal and external environment of IS	1. Internal factors include issues such as unrealistic plans, bad development methodology and mismanagement. 2. External factors are listed as inadequate funding and low customer acceptance. 3. Certain factors are between the internal and external environment. Examples include communication problems and inadequate user input.	
Stages or phases of system development		
Zhang *et al.* (2001)	Their study looks at the relationships between failure at analysis, design and programming stages and certain aspects of the project such as program size, total procedure lines, cyclomatic complexity and business requirements.	At the system analysis stage all four aspects are proved to be significant. During the design phase only business requirements and cyclomatic complexity are good predictors for failures. At the programming stage only business requirements are significant. The

		system must be developed in such a way as to be adaptive so that it can live with changes in the business environment.
Smith (2001)	A project can experience trouble at any stage of the life cycle.	
People issues and training		
Paton (2006) Kavanach (2004) Nulden & Scheepers (2000) Van Huy & Chae, (2004)	Aspects such as training and skills development of developers on the one hand and users education on the other hand should be done with due care. Systems are built for people and therefore their context should be taken into account.	Issues such as organisational culture and internal politics, users' preferences on IS issues etc. should be known. The lack of management of change, training of skills and context knowledge can therefore contribute to failure
Conflict		
Warne (2003)	Conflict between different stakeholders is a contributing factor to IS failure. The reward to manage and resolve conflict in the IS environment implies a higher success rate.	
Faraj & Geter (1998) The issue is to put the blame elsewhere	They analyse failed projects by using a conflict-theory lens. IS managers rarely take the blame themselves or place it on their group, but prefer to blame either situational factors or their clients.	These factors include reengineering of the client organisation, the inability of the client to give a stable set of requirements or a lack of commitment to the project by the client.
Professionalism and standards		
Oz (1994) Professional standards and honesty	A failed IS 'CONFIRM', which was to be a comprehensive travel industry reservation program is described as having several problems including Unforeseen technical difficulties and failure to understand system requirements. Some people involved in this system did not disclose the true status of the project in a timely manner.	The lesson to be learned from this case is that professional standards must be in place and that honesty is very important.

Table A1 - Studies indicating causes, factors and categories for IS failures (own construction from sources indicated)

Appendix 2 Retrospective narrative analysis

Group 1: Super Users (SU)

SU1: "Yes, sometimes it is a bit unrealistic and if you have to rush - the possibilities for errors just increases. Maybe I am overoptimistic, but since we implemented the current system and worked with all the campuses, we are managing much better than the time when we had just implemented. Each month that you work with the campuses, and as the system improves, things just seem to go better. I am very positive about the system. You also handle it better as time goes on."

SU3: "We look at the important things like this grade certificates was, it was a necessity, because it have changed a lot, the whole country, you know, and everyone that is immigrating, that is where it comes from, and the people that were doing it by hand just couldn't keep up you know, then we did it. SU4 and I really struggled a lot because we had to work late nights a lot but we did, and some of the academic records that were in Afrikaans and English, I sat and printed it in English and she sat and printed it in Afrikaans. Just to give it to them and tell them here it is, you know, but that was sorted out afterwards. And we had to put in a lot of time with the development of the system, we nearly worked day and night, it was really hectic, but that satisfaction when we pressed that button, it is really wonderful, you know, when we did the first registration, and you can immediately see where it is stored, it is immediately on the grading system, and it is immediately reflected in the finances, that is just one."

Analysis: This person looks back at successes and the hard work leading to them. They had to put in a lot of effort and overtime to get the new system in place. But they could reap the rewards and enjoy the outcome.

SU5: "You see, I helped in writing specs for the grading-system, and I helped with the development of the system, I helped with the testing of the system."

SU5: "... well I have to tell you that I have been working with the grading-system for a very long time. I started working with entering the marks, I don't want to lie when I say since when, but I think it goes back for the best part of twenty-five years and was basically all I did back then, but that was on the old system that was written in DOS. But it also gave us a lot of grief and I was at a stage and I mean, they could not change anything about the system for us, it was written and was a given, and the person that wrote it originally wasn't in the country anymore. So you were stuck with what you had."

SU5: "And then we went and said we wanted everything precisely the same as the old system plus, because with a new thing you would expect to get something better, and there were a lot of things from the old system that we wanted to change, that wasn't possible previously. Then we put it out there for them (developers). Then they wrote our system for us, and then they implemented it, and gave it to us and only after the testing phase, which took hours and hours of work, because you have to test everything around that station, and I can say now that it was slow, because your servers was slow, and just as we started testing the stuff - we had to sit and wait. And then I told the guys, I don't know what you are doing, but no man can work with this thing, I had to guess. Then they would say – why do you want the thing like that? Then I would

say – I had to add marks for a thousand students in the Economic Sciences which are big groups of students. So I checked how the system manages a big group of students. If the other guys (developers) test, they would take six students. If I test, I take six hundred students."

Analysis: There were certain expectations from the new system. Looking at the old one there were new functionalities necessary, but the users did not want too many changes – they wanted something better, improved, but based on the old system. This shows the resistance to change that appears inevitable when you work with people. It can be seen here that the reality of how the stakeholders use their system is different than that of the developer. The volume of data in the two test scenarios is indicative of this misalignment of contexts between the different stakeholders.

Group 3: Information technology division (IT)

IT1: "...And we had to go live real quickly. We went live on the right time. The stupid mistake we made was to bring the whole system forth, you know, put it out as ready, instead of focusing on what was necessary at that stage. In February you just wanted to know who is in your class, and want to start loading marks for him. You don't want to calculate the semester marks or final marks – that only comes in May. So what we did next was a bit difficult. If we had just focused on that, but, you can remember: we built in a kinds of snazzy stuff, and suddenly we had colour, and suddenly we had interactive stuff, and if there were new students, and he didn't have a class group, a flag showed on him, that showed he was new, and the moment he was assigned to a class, the blue flag would change to something else, and all kinds of stuff. It was very nice and cute. And when it came in, the next task was the student record system and finances – the money and records. They had to go in at the same time. We didn't want to do the interface thing, because it was a real-time system. The moment a student would register, the money would be asked, and after everything was completed, it had to be printed, and here the receipt would come out. He must have been able to pay there and then. So that was the idea then. And then we were busy for two years… I think it was two years that we worked on it. I can't even remember what year… so at the end we went live with the student- and money records. And naturally the registration was the big test… Yes. That was in the years when a new thing started on the campus. The people started camping out in front of the Registration Offices. You will remember that!"

Group 4: External Company (EC)

EC1: "Ok the run-up to the student system was actually more of a green screen type of system like the Unikom system. I was now I think, already 16 years involved with student based systems, or universities in some or other way, so there was the Unikom system to which the university also took part in and the University decided to, or the old unmerged university decided to make a change, to move to a new technology, something more friendly, more of a Windows type interface. You know, the old thing really was a dead green screen type of interface. So there, there is a long history, but that is basically the run-up. And then we had to choose the technology, you actually know what the business of the university is, but the technology to run that kind of system must be a good decision, because you can't decide on a technology that is not capable of doing the work, or of having the performance, or we cut the old stuff. Natural ADABAS was close to the operating system I would say, although it was

fourth generation, everything was close to each other so the, the reaction time in it for ADABAS was exceptional and I can bet you that to this day it is one of the better performers out there. But if you move on to something new, you can't take a step backwards, because performance is always one of the factors."

EC1: "One of the things that you start to, when you start with your system is that you have to make certain decisions concerning your architecture and architecture doesn't just involve technology, it also involves your business architecture and your information that you are going to carry. One of the things was that the data has to be clean, something nearly happened a few times to me because of the statement I made, because the old system just didn't have any integrity."

Analysis: Data integrity is an important issue when converting to a new system. Here it is apparent that the data coming from the old system had problems and the team had to deal with it.

EC1: "So it was an intense workout to get right, and I think we definitely lost a lot of time there. So it was the data migration, the learning curve around the new environment which was challenging and I think you know the new technology…"

EC1: "Oh yes, that was something different. The other thing that happened was, we were down in the City2, so the development happened on machines that were here, here in City1's computer room. Okay, now you have to work with a line to Potchefstroom. You had no idea, some days you would click run, and then your application would start to run, so that you can start with your log-in screen. You could go and take a walk, make coffee, return and when you sat down, the window would pop up, and you could start typing. So you, your developer easily sat 20 to 30 % of his time just waiting for a response..."

Analysis: The distance between the client company and the developers posed a huge problem at times. Slow response time meant a lot of overhead that could not be accounted for.

EC1: "And also from a historical view, because especially what happened with Java, the Forte to Java thing is, that is another story, the code has been switched around, but the languages doesn't react in the same way, so if you had a test case you could, let the user run three years of test cases on problem areas and then you could have seen that sometimes just a field's value causes it to behave differently, so now you as developer with all your knowledge of what you have tested, but you just have not thought about the one field's value, and there are fifteen potential values, you have just tested four or five of them, but the other, then you think everything is all right, you don't have to test the other ten, and it is the last one that you would have tested, and then truly, that is the one that they test first and then there is a fault. So testing tools in terms of repeated testing to simplify and ease things will help and will be less time-consuming - would definitely ease things."

Analysis: Testing was another challenge in that the development environments differed. The people working on the conversion to Java were not knowledgeable about the context of higher education but were good only in technical terms, etc.

EC2: "Yes, the whole idea was to move away from the mainframe work and that it would be replaced with new technology. We first did a pilot project just to see if the technology that they chose was going to work and to place certain standard building blocks at the bottom for an infrastructure so that it is stuff that we can reuse and not develop them again for each subsystem."

Analysis: The developer thinks back at how the new system originated. The driving-force was re-use and constructing building blocks when using a new technology platform.

EC2: "I think the whole user testing took about a year, so it was much longer that we originally planned it."

EC2: "Now to have a team of ten people is, sometimes it is necessary but it is, it is actually a too big team to work effectively, but that wasn't for a long continuous period...."

EC2: "I think an error that we made there was, the system is too big to think that you can specify everything now – at once."

Appendix 3 Living story analysis

Group 1: Super Users (SU)

SU1: "It depends on the impact that it has, because in finances the impact with the records can be massive, the finances and records part is the biggest, then it is difficult because you have to explain to the users what has happened, what caused the error and we do not manage operational tasks, then I give them an explanation of what caused the error and what has to be fixed and they are not really happy with the communication of the problem because they say that they did break it and now they have to fix what was broken as a result of other things. Then it is a bit difficult for me."

SU1: "We are busy all the time, there isn't really any time when you are idle and don't really know what to do. I do the month-end – it keeps me busy for about a week, to close and balance the VSS system and transfer to Oracle. In between we do yearbooks, fixes that do not necessarily go through to campus and then nagging users have the way to make you feel discouraged. But, I don't know, we are already in a frame of mind to work with them, you calm down a bit and say that you will get to it in a short while and you just go on. We really aren't terrible drama queens and just take it as it comes."

SU2: "Bad. You know, that is where SU4 comes in, and then you get for instance a very skew email, yes the wheels comes off and goes on. One learns, and look it is not personal, you must not take it personal. It is the system, let's try the… I always say, let us handle the problem and not the person. So that we don't always get personal and I have told Financialperson1, look here this is a problem, it is a big problem, it is priority and then SU4 have told them that it is priority one, we are busy with it. We come in after hours to handle it, it gets my priority. So they are kicking and screaming a bit, but we are trying to quiet them down a bit and stuff."

Analysis: We see in this excerpt that the situation between the Super Users and Users are not all the time easy to handle. Sometimes they are trying to move themselves from the person and concentrate on the error so as not to make the issue personal. This person also shows her commitment to make the system work and come in after hours to resolve problematic situations.

SU2: "Yes, I do enjoy it, what is nice about it is, that you work on different levels and there is not one day that is the same than another. Actually a job where every day is exactly the same or you have to do exactly the same things every day would be very boring. Because there really is not one day that is the same. Sometimes there are crisis's and if one thing goes wrong, then another thing also goes wrong, so my things work, the two systems that I work on fall together in place."

Analysis: This excerpt shows the feeling of SU2 towards the system. The fact that there is movement in the activities brings about the satisfaction of her daily work. This also emphasises how this group cope with everyday crises. Even though things go wrong she sees the end product and recognises that there is interdependency between systems.

SU3: "Yes it is our responsibility to give training, but there is a main user that should help them with their problems... I mean, then one becomes a call centre, this is not your aim."

SU3: "Yes it works very good for me, what is difficult for me is that the developers are sitting so far from us, and I think if all of us could be close to each other and central, it could have worked a lot easier.

SU3: "Yes we have, but at this stage we are not allowed to talk to them, it has to be through IT, that to me…"

SU3: "Yes, but it is a problem for me because I know with what I am sitting with, now I am going to explain to one guy, and then he is going to explain to the other guy, and I don't think that is right, but if we have to work like that, and it does work like that."

Analysis: According to SU3 the communication lines are too long and complex. In the process of describing the errors to one group and re-telling it again to the next group important information can get lost or be misunderstood. She however says that if this is how they have to do it, they will – it is then how they have to cope and survive this situation. We see here the interplay between different groups of stakeholders.

SU3: "Because I don't think we have enough hands and people to be able to train everyone and I don't think that it is what is expected from us, you know, I think. Helping each other, I see it in the office here as well, I mean there are so many systems that are being developed from this office, and being maintained and every person has his system, but you also need the knowledge of the other systems, because the systems are so interleaved these days that if you do a reference on one system, then it can have an influence on the other systems and people have to know about it you know."

Analysis: SU3 refers to the fact that there are not enough people to train the other stakeholders. She also feels that the responsibility does not really reside with them. What is clear from this excerpt is that the systems are interrelated and that knowledge from other systems is necessary for each of them. There may also be side-effects between the systems.

SU3: "You know it is like that, because you have put so much into it, you know, and now all of a sudden it is working. You, you can see the results and that is what is nice, you know, to be able to see the results. But it goes along with pain and suffering."

Analysis: Even though the systems require hard work she has feelings of achievement – even if it comes along with pain.

SU4: "It is actually three things that we do: The development, to maintain and to make sure that it is ready and to support the users. In other words, we also supply all the training to the users on all the campuses in terms of the systems, if you are talking about those three systems, then we have to do all the training."

Analysis: She discusses her role and we can conclude that she knows her functions very well in this division where she operates.

SU4: "They have a rather big personnel turnover, and I can immediately see the influence it has on them or people, people that have been working with us since 1996 against the people that have started now, and a university system isn't like an office system that works for every office, you know it works in another way. It works in its own specific way you know, you can't just take it from the counter and install it here.

Analysis: Certain problems are highlighted here. Personnel turnover that influence the daily activities are referred to as well as the uniqueness of the higher education environment that have distinct characteristics and unique expectations.

SU4: "And take care of the errors. Yes, you know, the testing to me, yes… You know, how much data you have to set up sometimes to test it and then it doesn't work, and then you send it back and you, it is back and forward and back and forward, it isn't a simple story. You know it like that…"

Analysis: Again this stakeholder refers to the cycle of testing. It is as if a spiral of activities are going on, testing, sending it back and forth and trying to cope with these iterative complexities.

SU4: "No, not into the code, but you know, I am actually saying it, look, we are using it for a couple of years now, like what I said to SU3 the other day. We are so empowered, I can start diagnosing the thing and tell them to look there, the error is there, you have to fix it there. You know, you become empowered because of all the years."

Analysis: Her involvement over the years with this system assists her to become empowered in order to handle the problems more smoothly.

SU4: "It is now if we release something good as it is, you know, they don't know, users always says they want a tool that works, he doesn't care how he gets there or what happens there, his tool must work. And we try to give them everything a 'as ready as possible thing', but then it worked tonight, and then tomorrow morning after a new release it doesn't work, then it can be that they have a problem. Then they refer it to us, and then we report it to EC, they fix it, then they give us a new release and then we have to test it again, that we do test and then put into production again."

Analysis: The user wants a tool that has to work. In the process of giving it to the user we see a spiral of testing, rework, giving it back to user. There is a network of relationships, a livingness and movement between organizations and divisions that can be identified from this excerpt.

SU4: "And now for this Grade 12 marks, we are still waiting for the specifications from the department and now there are two months left before I have to gather those marks and we still don't have the specifications and all of the universities are on pins and needles, but in the meantime I have let the campuses know that I don't have the specifications. They have to let the students know that they can send their results advices next year."

Analysis: Other parties are also involved in this system. For instance the government have certain prescriptions regarding final year school learners and their results. This is an example that presents the network of relationships that exist between stakeholders of such a system.

SU4: "One thing is what I said earlier, if something doesn't work on a critical moment, you know if a user doesn't have a working tool. You know if you really needed something, and if I was a user, I would feel the same. If there is a queue of students standing in front of you, and this thing doesn't want to work, it is that one thing that is going to create the perception that this is a poor system and then the managers that support the perception you know that don't really know what is going on and is actually strengthening the personnel's perception, because we really struggled with this perception of being a stupid system in the beginning, look and I have been to other Universities that work with this package, that big student system that work with Softwarepackage1 or whatever. It is those packages and then they say how does one handle it now? Then we forgot that we have handled it. I am very proud of this system. It does so much for a person, but people are like that, that they don't want to admit it on their own; your own perception always is about the worst and not the best. People have that incline and that is what we have found on campus that they think they do not have the best, but they were for instance, Okay an example if the users from City3, they came back and called me and say, the university in City3 has this system, and it can do this and this. Then I tell them listen here, I don't want this word of mouth stuff, put it together and then you come tell me what that system can do. Then they came back to me, and when they came to me, they said it can do this and this, then I said, you know what? We can do it too, and they can, no but we can do this and this. Then they knew their system so bad that did not know what it is capable of, but they had that perception, had that feeling of it being a stupid system, you know. But I think that have changed a bit, but there are still people because they struggled at a stage.... But no one will say that it is a nice system and I am telling you it is a jolly good system. So I think that is that, perceptions and if it doesn't work when someone is under pressure, than I can understand it and if it would keep doing that, then I think it is a failure of a system, but you have to work hard to get your own perception of pride regarding your own stuff."

Analysis: SU4 discusses the systems looking at frustrations of users which she understands, referring to perceptions that can be wrong or inaccurate because they do not know their system's capabilities. She is very positive and proud of their system presenting it as a ''jolly good'' system.

SU5: "But in general I have to say that I am working quite happily on this grading-system, there really are only a few faults. We are at this point where a lot of the requests have been solved..."

SU5: "So, I think that most of the guys, all our systems are rather user friendly, I don't think that the *systems that we are using are very difficult to use. I think they are doing very well, so yes, and then of course I am handling most of the training on the grading-system."*

Analysis: SU5 is very satisfied with the system however she acknowledges that there are still some errors. Most of them have been resolved over time. Her perception is that the system is easy to use and she talks about the system as if living – "they are doing well". She also refers to her role as training the users.

SU5: "It, it works on the one hand, and on the other side I feel that you have to have a long queue. Sometimes it feels like you can shorten the queue if the users could report it directly, say to the Student admin System office, but then I understand them as well. They can't take

seventy calls, because if it happened this morning, like we got a release this morning, then halve of the reports didn't work. Now I got emails from five people, and three people phoned me to tell me that the reports doesn't work, but then we already knew it. Then it was reported already, and they have started looking into it already. But I mean now, I received this eight. Now if this eight, plus the eight from Campus2, plus the eight from Campus3, phoned the SAS-offices directly, then I think sometimes a person, that some of the things goes missing between what the user experiences and what they report to me, and what I report to the other side. I mean now we have to sit and wait. And I am trying to the best of my abilities to tell the user – just remember, it can be fixed within halve an hour or by tomorrow. It causes terrible, terrible upset because some of the important problems can sometimes take three to four weeks."

Analysis: The reporting of problems and errors is complex and somewhat frustrating for many of the stakeholders involved. Problem reporting follows long communication lines before it is properly structured and send to the right people to handle the errors.

SU5: "But now I have attended some of the training sessions that were given by the SAS-office, which I felt they weren't going through it in enough detail. Because you sit with the problem that if someone hasn't really worked with a system, then you actually just talk into the air. You actually learn about a system if you sit and work on it, but then you have to be prepared to ask as well. And now, now it can be that you ask the wrong people, because another person can show you the wrong way to use the system."

Analysis: She is thinking about the issues of training. It is not worth much to train people that have not previously worked with the system. It is also not good to ask people for advice if they cannot really give the correct guidance. The training has to be planned carefully.

SU5: "Well it honestly has to measure up to the requirements that you set up and it has to give you the result that you want."

SU5: "Yes, so in other words, if you want it to calculate the marks for you, it has to be calculated correctly, I mean, that is some of the things that you have to go and look at. And then you have to go further and connect the grading-system to the student records-system. You know, is it doing that stuff correctly? And are your users satisfied with the system and can they use it without a lot of help, I want to say. You know, in other words, is it a system where you can sit down and just by looking at the screen, and do what the screen is telling you to do, or with a little bit of training, you can go on. And to have fewer faults and …Yes, I mean to be free from faults."

Analysis: SU5 is giving her perception and views on what a successful system should be giving to the user in this context.

Group 2: Users (U)

U1: "Yes, they are, they are rather easy. It is not something that you struggle with; it is a straight forward easy system, so it is a very nice system. It is linked to the other system yes, but

if you are now starting, it is a nice system, you have no problems, you type in the student's number, it gives you the record."

Analysis: The system the user is referring to works nicely for her – the student record system.

U1: "Yes, flexible, not at all! .... Then I have to pull the marks into a text system that is different from what they got. It is quite difficult."

Analysis: The user has a problem with the inflexibility of the system and then on the other hand her clients need things differently. She is pushed and pulled from two sides. She has to use the system as it is presented to her (the reality) and the lecturers want different functionality. She finds herself in a difficult situation. Again the network of relationships is shown and multi-voiced perceptions of the system are presented here.

U1: "Slow, especially the statistics. It works, it does its calculations, but it takes about, and I am not exaggerating when I say ten minutes, because I can go to the kitchen and the bathroom and come back, and then I am still looking at a blank screen. Then you minimize it, and go on with your other work, then suddenly it pops up, and then you have your statistics. No it is rather slow…"

Analysis: This is an example of how slow the system is and the frustration the user has to live with.

U1: "It doesn't always work out correctly, like the lecturer would for example round it to 36%, and as you do the calculations, it would be 36.4%, and if you do the statistics it would count the .4 in. It adds the marks, so I know Lecturer2 that have sent it to me - was for example - was percentage wise 45.6 and here within the system it was 45.5. So it, it loses a percentage and with the calculations it also makes a difference."

Analysis: Here is an example of rounding errors with the marks. This problem is context specific but is an important error to resolve.

U2: "I think it is working better at this stage than at the beginning, but it is still the story of fixing one thing, and then another doesn't work. That is what I can remember now and then especially the response time, you know, like when the participation marks and in the exams, then it looks like the more people working on it, the slower it gets, especially with reports, and the printing of reports. There you can sometimes minimize it, and go on with something else. Good, and now I don't know if I misunderstood. Like User3 visited me this morning. She wanted something, I think that it was marked out of 106, and then you start to pick up problems, if it isn't marked out of 100 then it is a nightmare."

Analysis: This user's perception is that the system is better now, but she remembers the times of the numerous updates and changes and the influence on them. She is still involved and helps other users with problems.

U2: "You see, we were trained, we had group training and a guide. Now that works pretty good, it tells you what you need to do, but then you have to keep to the 100. You mustn't try all sorts of stunts. Then you are going to struggle. So, it is, it is a, we didn't really have one-on-one training, but we had the training and I now have that guide thingy of yours, that works good for me."

Analysis: U2 is satisfied by the training they got but you must not try anything else that is not standard. The system is not intuitive: The moment that your needs are different from the agreed standard, you experience trouble.

U2: "You know – that statistics thing -it does not work"

Analysis: She chooses her words in this fragment as if the researcher should know about the problems and should have sympathy. She refers to a context specific problem that the calculated statistics are not correct – that points to the means and averages of class groups for different modules.

U2: "I am not an accountant. I cannot read the thing ... you understand?"

U2: "Listen to me, this is a complicated system, maybe if you have a business degree, but I have grade 8 accounting from many years back... and there are inconsistencies. Sometimes a minus before the number and sometimes not. The other day a researcher thought he had no money in his account, according to the report but then it was just the opposite!"

Analysis: The user is referring to a generated report that she cannot interpret. She says she is not highly qualified expressing her concern that the report is overly complex.

U2: "It is the changes that can confuse one, you just think you have the rhyme under control then oops it does not work like that anymore."

Analysis: The user is again referring to the frequent changes to the system that may confuse and frustrate the users. This is a given and the users have to cope with this state of affairs.

Group 3: Information technology division (IT)

IT1: "I think that one of the problem situations, but it looks to me that it is so in any system, was that you're planning, your project planning versus what really happens in the end. You know, you hit obstacles; especially if you start with something completely new. I said lots of times: people sometimes don't know what they don't know. Now if you don't know what you are budgeting for, or don't know what you are going to hit, then how can you budget for it? Or plan the time?"

IT1: "So many uncertainties. And no man, not even the best project managers or whatever, are a 100% certain of their parameters. Because other stuff will always surface. The second thing that was a bit of a problem to us, is I think scope creep. You sit down in sessions with the user, and ask them – what do you want? Then he will tell you that he wants this and this and this.

But the day that he gets the system, then it isn't what he wanted. No, that is not what he meant. Then he will change it a bit, you know."

Analysis: This project manager reflects about the problem situations. People do not know what they want. The estimations for time or money are always difficult.

IT1: "The other thing is: I am a total proponent of... let me just get the right words… building prototypes. Where the user sits next to you, then you have to show hiU2: this is what your system looks like, and this is what it does. But in a way we even did that. We even released a small kind of prototype system, an online specification-system. But all that did was to show the user how the screen is going to look. But it didn't show what it did behind… This field, if you fill in something here, what does it do, and what are its prerequisites? What does it need or for what is it used? So it was a bit strange. And it is a big void; I think it is like that everywhere, but especially at the University. The end user just wants to press one button. It is easy for them to say - but, I'm not into IT, I don't need to know about IT. I don't need to know what the system looks like, or how the system is built. I just tell you: Give me what I want."

Analysis: She is reflecting on the activity of prototyping in order to let the customer get first hand insight on the feel of the system. She also hints at the comfort, or almost laziness, of the user that just wants to press one button and would also like to have a system that does just about everything. It is clear that the user needs more insight into what a system can and cannot do. It is evident from this excerpt that the perceptions of the User group and IT group differs on what the users want from the IS and how they would like to operate the system.

IT1: "Yes, that they will just believe you. I mean, if you look at 10 people, there are maybe one person that will respond. So it is one of the more difficult issues. And you know, we learned a few things along the way. We didn't do everything perfectly. How many terrible developments have we done, you know if you look at the methodologies, how you develop. Not a lot of time is given to change management. They say change management, but do people really know what change management imply? I don't think they realize. And because we are IT-people, and we are people that are inclined to be task driven, and to get the job done, we don't pay a lot of attention to how the other person feels that is not an IT-person. I mean, when you are busy developing, you get used to what the screen looks like. You get used to how you should click, and that kind of stuff. But you don't realize that the person that has to work with the system at the end, doesn't get a year, or 9 months, or whatever long time, to get used to the system. That it becomes second nature to him after a while. Another example is the Oracle-system. I know it isn't VSS, but it was one of the things that was a big change management change. There, the screens look totally different than VSS. There were no flags popping up and that sort of things, and the people also came from Unikom. Now you used a totally internet based system. So it was totally different from the screen where you sign in and all that things. And you get weird massages in between, or the screens don't pop up because the pop-up blockers are on. You know, those kinds of things, things that are weird to them. Tell them to surf on the internet, which they can do. You know, load funny kittens that run: they do that! But the moment they get such a thing, they freeze, they become scared. And we are moving to version 12, maybe in a year or two, and I told them, we should start telling them now what is going to change. For the simple reason… start things…"

IT1: "But I haven't heard of anything major that prevented people from doing their work. And like it is, if you are used to enjoying a cookie with your 10 o'clock tea every day, and this day there isn't any, or a specific day, then it just doesn't feel right, you have become used to a certain ritual… So, I think that's another thing. Our users are getting spoiled. You know, they… I don't mean to offend. They… it's their privilege or their right to become like that. But I sometimes think they are losing perspective. To keep all these things going… I know there is always an issue with after-hours help. Everyone wants to help after hours. They don't realize that to offer an afterhour's service someone has to be here at ILS, there must be a network guy, there must be a database guy, there must be someone to… It is not like the old days where you had one guy that could fix everything. It is much more complex now. It takes up a lot more time, you know."

Analysis: Again the issues of change and comfort are mentioned. She explains that users do not want to change and are spoiled. They want support – even after hours. And that it is not possible to meet all their demands.

IT1: "Usually you look to see what of the users' expectations you can commit to. And not just expectations, also how you can lessen his workload with what the system is doing for you now, because if it has to do extra things now, then it isn't that much fun. And how you can empower him, so that he feels, he can do stuff that previously he couldn't do. His service is better and so forth. Then I am happy."

Analysis: This stakeholder again reflects on what she would like a system to be able to do in order to be successful. The users have to be empowered, their expectations met, service must be improved and their workload must be reduced when using the system. If all of these are met then IT1 is content.

IT2: "We are functional and technical. I have to say, 20% of my day is spent on technical work, so then it is setting up the servers, getting the servers ready… performance tuning on the servers... then it is the same: then the request comes through, we change the servers so that it can function… then testing is done again, then the testing is just a little bit bigger. Because like I say I, we work on the integration as well, so some of this systems communicate with the other systems."

IT2: "We had big problems, they physically… they make a change or something, but they don't see the whole picture. And just as it, as it is being deployed here by us, but that really happens minimally, but sometimes it comes through that they make a change there or run a script physically on the database, and some of that script on the whole environment, they don't realize all of the factors because it is so, we have a very difficult environment. Then they don't realize the effect on the rest. But with this integration that we have, most of them we pick up very fast because if the integration stops, so we get problems that goes through the entire system and then nobody knows how, then it goes through the testing, then it goes to the production system."

Analysis: IT2 reflects on his role and responsibilities within this environment. It is shown that systems must be integrated with the environment as well as communicate with other systems.

The complexity of the subsystems is shown and it is clear that there is interplay between systems. This stakeholder reinforces the fact that when context is not known (big picture) the realization of factors to be taken into account cannot be done correctly and that has a negative influence on the system development and maintenance. The livingness here is illustrated in the complexity in and the everyday interaction between systems.

IT2: "Look here, the users report to the super users, that is SU4 and her team, we don't talk to the users at all. So SU4 can understand our language a bit better if I can say it like that, they can say listen here we expect this and from there on if they say we have to apply something, then we apply it like them… but it is difficult because their times are different to ours. They don't realize that they sometimes want us to do things NOW, understand, in time, but they don't understand that if we do that thing now we are crippling the whole system. We can't physically bring the whole production system to a standstill but they are being pressured from their side, because for instance say these graduation certificates needs to be printed and because we are in a switch over phase - it has happened that everything has worked, they can't get a certain problem fixed at EC and if EC isn't fast enough the pressure is on them and then they put the pressure on us and then… I think we can realize their situation a bit more because I can understand if someone is going to call me the whole day and say that he wants it now, but I don't think they understand our side where we say but we can't do this thing now, we will need to do it after hours. And there are complications, we can take it but that is not to say that with the integration in the other systems that it is going to be 100%..."

Analysis: This stakeholder discusses the relationship with different groups within this bigger environment. There are pressures from within and from outside (EC). Not everyone understands the difficulty on fixing errors when it appears. Often it is the whole activity of shutting down systems, uploading new functionalities, integration, testing and looking and side-effects and so forth. There is a degree of tension visible between stakeholders. The whole picture of now is accentuated by this stakeholder, stating that all problems or wishes cannot be complied to at once. Some things do take time and planning first.

IT2: "Ah no, if we, the way I measure if it is a big success or if a system or if we are physically the super users, if they say in the end listen here, we are satisfied thank you very much for all the effort and everything that you put in, then I would personally see it as the system is finalized. There isn't any, the milestone is reached and we build it up from there. Because they, they communicate with the users. They are direct, they are actually our first link, so they take all that, if they are happy then we know our whole system is happy."

Analysis: IT2 offers his view on a successful system. He distances himself somewhat from defining success for his own group. He measures it from the view of the Super Users – his group's first connection within this environment - if they are satisfied he knows the system is happy (or then he is content).

Group 4: External Company (EC)

EC1: "Those two systems are kind of big cannons. So they took a long time to develop and in that process, now you implement it based on what looks logical to you, and naturally if you

miss one of them, miss one of the cut-off dates, then it means that you have to exchange data between two old systems which is bad. So through that we learned to try to keep things as small and compact as we can. You have to deliver something to the user as you go on. That was not possible in those days in the sense you have to have your critical functionality. Look at a report or two, or inquiry or something like that couldn't have been there, and they could live with that, but your critical functionality that capture your important data, you know you have that in one place, so that was interesting. Because the back and forth between two systems was very challenging. Grey hair, you see?"

Analysis: Here EC1 is looking back at times when they did things in a certain way regarding sharing of data – especially the interdependency of systems. This story contains a metaphor of grey hair to explain the frustration that they had to cope with. She also uses the term – "interesting" – as so show how she tried to accept and endure the situation.

EC1: "Yes, then you really can't blame them and I know there are many companies that say – well this is the specs, and it doesn't matter what happens, this is what you wanted, this is what you are getting, and if you want something else, you will have to pay for it. Now, in the beginning we didn't work in that fashion, we were very accommodating, but I have to say that Northwest University or Potchefstroom was also very accommodating in the sense of, okay there we have missed another deadline, for whatever reason, you know people miss deadline for different reasons. So then we worked through this opening and then it is user testing again…"

Analysis: This excerpt shows how the relationships are defined between the stakeholders. The developers are very accommodating towards the users and the institution is compliant towards the developers. And this situation is acceptable to all the groups.

EC1: "Now we've got Java, and now we are there below (Cape), but Java itself in this respect is a third generation language so the compile, run, or whatever takes ten minutes. So it seems to me you can't win and then you have to sit and wait to test this one line of code, and then it is incorrect because we didn't think about something. And to me it is really frustrating that they don't think about it. I mean, now you see the problem and you try to put mechanisms in place to overcome it, it is like you are pressing on a balloon that is filled with water, something else always pops up that you did not think about. So to me it is a challenge that you… that a person must create a culture so that people will start to think, and not just jump in and say I want to code now. And if you see something that you don't understand to just ask someone, because it is not about ego or anything else, it is about getting the job done as soon as possible. Done correctly to say. So that was one of the challenges on the way, the line problem, people that don't think before they start working and then people that just – what I must say is something that tickled me was – if you ask a guy how far he was with a function – he says I'm almost done – and then later on you realize that for a developer, almost done is, I've painted a window, I've done the update and the insert methods and maybe a get function. So its three methods written on one screen and therefore I'm almost done. They haven't even done any validation, nothing. That you have to say later, and I see it to this day, especially if you get someone new, so how far are you? Almost done, but then you know, ha ha wait a minute, it's like the window

is finished, or the back part that is finished, have you done the validation – No I'm not at the validation yet. They always leave the validation for last, anyway: my problems. But that are the challenges that you are faced with and that people, they don't think, they think they are almost finished and they are not finished and so on, but I have to say that if they get more experience this improves…"

Analysis: This passage indicates a small story within the bigger account. This is part of the Java story. The system had to be converted to Java from a previous platform and the EC faced huge challenge with this. Apart from being physically far away from the institution they are developing the system for, some part of the conversion was done by an eastern company. Challenging factors that are pointed out here are response time of the systems and the slow lines as a result of physical distance, and some new contractors who were not experienced and could not acknowledge that they struggled and answered question about their progress with – "almost done". These words endowed with context, clearly meant different things to the different groups.

EC1: "At least we reached the end point on some or other way. I think in terms of, so it is half the process that you have to go through just to get there. I think in terms of the user, or no there is how we see things now, because we are these outside contractors, okay and you, I have more or less explained how we went to work on it and what I experienced as the challenges that come with it. Now you get the person that stands on the receiving end and in your case, or in this case the Northwest University. And what comes with a project like this in a user, from a users point of view, it's not just about you had this system, now we are going to make a new system and everything is fine and "honkey dory", I am not even talking about the testing and the faults and things like that. I am talking of the whole, you understand, this user could log in with closed eyes, enter a program name, enter a student number, push buttons, they did not need to look at how to use the thing. And now you give them this new thing that they have to do with their eyes open and that whole… some users are open for changes like that and are satisfied and are happy and they… like they say they embrace it. You know, good or bad, they embrace it, and they move on with it. Then you get those that choose; they are not willing to do it and they are the, the actually make life very difficult for you. I have to say, we didn't get many of them here, but from my previous experiences. Those people can make it very difficult in the sense that they will not give up on their point, and they will keep going on and those guys are usually the guys that complain at the highest authority. You know, so you think ah this guy can only complain to Pete, which is his direct boss, but then he goes and complain at the CEO and you know then the red carpet is a difficult one to stand and let him buy into the whole concept of the user and to try and condition him so that it would be an acceptable process for him. It is, I mean we say that with all projects that there must be a main user and there must be a sponsor and blah blah blah and they have to enforce authority. Someone very nice very wonderful that there is someone like that, but there is still that person on the ground that doesn't like this stuff and he must be managed and his emotional welfare I would say must be managed to make him change his mind and some people like me thinks it is wonderful, most people here are fantastic, they move on fast. But you get those difficult customers that… that is another grey hair that I have. That really makes you, you think later on that you must just give up because you, you can't take it anymore."

Analysis: This is a very good example of how reflective this developer is. In the end the system is implemented and working and most users accept the system with problems and all. But then there are the difficult people who ignore normal communication lines and complain to high authority. These incidents and users who do not adhere to set communication lines and the protocol of logging problems really complicate the day to day handling of errors. It can at times be so terrible and challenging that she thought of giving up.

EC1: "Like I said, so we learned. So it still is an interesting environment, you know the, yes I don't know, I don't know what to tell you, the thing is it doesn't matter what you do, there are always another bunny that jumps out of a hat somewhere and it is not because it is a surprise."

EC1: "I like it, when it is between boundaries. I don't give up easily. I like problem solving and to create things, so you know if you have done the session, have done the design, and finally someone is coding it, you see the user using it, it is an unbelievable satisfaction, but sometimes there are things that you just struggle with and it feels as if you have struggled with it for months."

EC1: "Shorter cycles, deliver something faster, the user can use this in the mean time and you know, and you can still go on with the development while they, if you have delivered that functionality, they will start thinking that this works for me or it doesn't work for me. So you can take affirmative action as you go along, as to where you take a project over two years and then give it in after the two years, then it is, oh no, they find fault with something that you did half in the beginning, so I would say that the approach is moving more to a agile type of situation. I mean, we won't move away from an UML design point of view, but we are definitely trying to deliver smaller packages things faster."

EC1: "We modify it as we go on, we are open. It is the one thing that is nice where we are working, or if you see or hear about a better idea or that can work, and then we use it and implement it, apply it. If you see that it isn't going to work, then okay wait, back to the old formula, but you usually haven't lost anything. You just have to be flexible enough to see fast enough that it is still not going to work, and then make the decision to which side you are going to go, and then you go on, so yes I would say that is more or less our approach. Our own brand made up of a couple of things, because some of the thing are very theoretical and a lot, you have to do this and then you have to do that and I find that in the outside world you can't always use textbook approaches, there are many exceptions…"

Analysis: EC1 reflects on the learning cycle. She admits that there will always be something new, something that you have not thought about previously. She talks about the livingness of such a project and the phases and cycles that are gone through. She also stresses the importance of being flexible and be open during the cycles and points out that sometimes rethinking and planning and redirecting are necessary. Furthermore, experience has taught her sometimes you have to make your own plans because textbook solutions do not always work in practice.

EC1: "I still have to see this type of project, big project that comes in on time and in budget, that doesn't happen. Small things, yes, a lot of times they come within time, because these things teach you that next time you guess - you guess five times as much time."

EC1: "Some you win, some you lose, no matter what you build in, some you win, some you lose, and this is how it is..."

Analysis: EC1 has her doubts if a complex system can be completed within time and budget estimates. Experience also teaches her to make provision for more time for the next project. EC1 accepts it as a fact of life that even with estimating more time there are occasions when you just have to live with problems – some you win some you lose – and that is how it is. The emphasis is on accepting certain outcomes.

EC2: "If they didn't like the screen lay-out, they could log it there as well. So the idea with it was that the user could actually get a feeling for the whole system before we have done the effort of developing everything. It worked rather well, although the time, I think the time lapse was too long at times."

EC2: "There was a learning curve and as we developed, we involved more people, so they also needed to be trained, and what I think we underestimated at that stage was the leap that you had to make from the mainframe, because all developers we had were mainframe developers."

EC2: "We must have broken it up into phases and that is what we did with the later systems, we broke it up into smaller building blocks so that you have a phase one where you approve specs and build and give it to the users immediately to the users for testing. And at that same time you can start with the phase two specs, build and release. So the users are more involved and they see it faster."

Analysis: EC2 reflects now and during the process on how things were done, thereby gaining experience for current and future developments. It is seen from the above that the developers do not just follow rules/stages and phases – they are mindful about how and why they do things. They also adjust to new practices as time lapses and the project progresses.

EC2: "Yes and you see we asked them: should it be there and they said yes it would be nice, we would like to use it one day. Now it is five years later, it still isn't being used and if I think of how much of your management time, your development time, QA (quality assurance), specifications and things that are used in more than one place like the person information is also used there and if it changes, you have to go and check there if it also works. It is things that add a lot of time on development."

Analysis: She gives an example of redundancy that was requested by the users. Users want certain reports or functions that could be nice to have, but in the end they are not using it. This takes up precious development time and other resources.

EC2: "And it was a whole spectacle on its own... and I think the conversion was supposed to take eleven months, and it ended up close to two years. We basically did a pilot project with them to see how they were going to convert it and then, they sent us the code, and then we told them no it is not correct, you should do it like this. So then all of these systems had to be tested again, the users had to be involved with it as little as possible. I think that at the end of the day their involvement was more that they expected."

Analysis: EC2 illustrates the problems encountered in the Java conversion subproject. She reflects how the users were also more involved than was originally expected. There is multi-plottedness here in that EC envisaged certain actions, the abroad company had ideas on how their work would follow, and the users had their expectations on the conversion project. In the end the reality was different but each group had to cope in order to get to system that will be used.

EC2: "A thing that we underestimated was the architecture of the system."

EC2: "I have to say, and what I think we underestimated, is because UDS is a 4GL and Java is a 3GL, there were so many things that UDS could do for you, and now you have to do it explicitly... You have to do it yourself in Java. Something simple like when we got the system from the abroad company: if you ran the system in UDS and you pressed Enter, an hourglass would appear, it didn't happen in Java. You had to code it."

Analysis: EC2 reflects on what errors were made and why it happened. Architecture, technology and characteristics and nature of the platform are listed as issues that were not expected to create problems.

EC2: "Because we didn't have that much time to convert it, because we still had to write new systems."

Analysis: Time is always a problem. The example shows that in reality people are pressured to do things simultaneously. This was not good for the users as well. They also had to work on current systems and make time to test the new converted systems.

EC2: "Communication was definitely a problem, literally to understand them when they talked and they talked to us... But I mean it is English and Afrikaans, so they could at least run the screens in English, but the detail of the specifications was in Afrikaans because the University was Afrikaans at that stage. So language was at that stage important, they wanted it in their language."

Analysis: This excerpt again shows the importance of communication and understanding between stakeholders. Here the specific language created misunderstandings. It would have been a huge effort to translate all specifications.

EC2: "I would definitely have worked more in phases; it is something we are currently doing, to build smaller building blocks, not to think that you are going to build the whole system from the start. The interaction with the users, it would have been good if they had dedicated people... Because even now if we give the stuff to them to test, sometimes it takes a week before you get feedback and in the meantime that developer is busy with a hundred other things and every time it takes him a while to pick up the pieces again. I have said it before that we need to put a dedicated business analyst in service there."

Analysis: This is similar to what other developers also offered as being learned from this project. Use phases and develop building blocks. The distance from the EC to the university also poses problems at times. She offers a solution – get dedicated persons on site.

EC2: "Yes, basically to learn the context and to put things into context because if a developer, we always spot, a developer, he always codes just as he thinks it should be and he tests just like he coded. He doesn't test like the user is going to test it. So as a developer, you don't really have the context, because you don't use the database on a daily basis, you will never see it."

Analysis: Context is important and this is echoed again here. Technical persons should know more about the environment they are working for than what the current status is. This passage emphasises the importance on the relationship and network between client and contractor or service deliverer.

EC2: "It is something that we are trying to address now, we have created a specific role on our side that just looks at the business and isn't technical at all. And I have to say, it makes a big difference, so it helps a lot and then I think that in the past, a big error that we made was that we took tests numbers, it's that typical iceberg, it looks so small, but if you look under the water it is actually huge…"

Analysis: In this passage the issue of business needs vs. technical aspects are highlighted. She acknowledges that errors were made and lessons have been learnt. Regarding testing she uses a metaphor of an iceberg – small on the outside but huge as a whole.

Appendix 4 Antenarrative analysis

Group 1: Super Users (SU)

SU3: "Yes naturally, it is my bread and butter, and it is to me, yes it is, yes I would like to. I won't want to do anything else. You know, you know what you don't have any boredom in such an office and in such a position, because you are always busy and there always are new things and so yes. No, I would really like to do it. It is nice to create something from nothing, you know."

Analysis: To the question if SU3 would work on such a project in the future she answers positively. She likes the challenges that come with this type of work. She is fond of being busy and learns and does new things. These systems provide her with such opportunities.

SU4: "You see and that is the thing. If people said it and I tell people on campus, don't live with an error. Don't do it to yourself. Report the error, then it is fixed and they don't always do it."

"They know it but people are terrible after a while, in a comfort zone, you know, if I only have to do this couple of things, then I don't want to do those other things."

Analysis: SU4 reflects on the behaviour of users. If they do not report current errors - that will become part of the future situation with the system – it is their own chosen predicament. It seems that some users would rather live with the errors than make the effort and reports it through to the correct group of people that will be able to handle it. This could however be that the users did not previously get satisfactory feedback and solutions and therefore their reluctance to report the errors. It is interesting to observe that the super user expects the researcher to have knowledge on the context –"you see".

SU5: "You know, there are too many things that worked, that encountered problems after a while. If that is someday cancelled out, then you can say that the system is ready. And totally acceptable."

Analysis: SU5 hints towards the future in order to predict when the system will be finished or completed. She incorporates aspects such as all problems being cancelled out and the system that has to be totally acceptable to the users.

Group 2: Users (U)

U1: "For me, it must be fast and it has to be accurate. It shouldn't be that you have to go and check that what I entered just now is it correct? It has to take away the frustration. It has to have that, I trust the system, okay you are going to spot check but not really, it must be fluent."

Analysis: In answer to the question how a successful system will be to her she gives an answer that include a few facets. She states aspects such as accuracy, taking away the many frustrations, trust and fluency. She also does not have to check if activities are done correctly – that is implicit qualities a system should have.

Group 3: Information technology division (IT)

IT2: "With today's technology, I cannot see how it would swing, however if a new technology comes, but with Java now..."

IT2: "If there is new technology … then the people immediately start doing research on it. I think, I get this idea that in the earlier years they didn't concentrate that hard on it, until the whole management realized listen here technology is very necessary… this system would never stabilize, I wouldn't say not stabilize, but it would never stop growing. There will always be change, there will always be improvements and as soon as it, there can't be any more deployments with us, then we should know the system is dead and all of us should leave IT, so it will always go on. "

Analysis: IT2 refers to the strategic activities of the IT division to research new technology in order for them to ascertain if it can/must be used. He also illustrates the dynamic nature of the system within a dynamic technological changing work environment. He predicts and states that there will always be change.

IT2: "You should come and watch everything we are doing one day, it is very interesting."

Analysis: This comment is made regarding the new technology he is working with. This is an invitation to the researcher to come and obtain insights into what he is busy with. It can be seen that he has the perception that the researcher will appreciate what he is busy with.

Group 4: External Company (EC)

EC1: "I had a few roles yes, I think yes, maybe that is where my other grey hair are coming from. So, yes, it was quite a challenge but I think people go through rough patches like that. But it was fun on the other side, but I don't know if I will do it again. I am too old now, and I don't have the energy. It is very exhausting, so on the user's side it was very challenging for me, I think for any instance is that you have to realize before you try to do such a project, that the user isn't going to sit back and roll over, and just be happy with it, they are going to challenge you on a variety of levels, why do we have to do this, they are going to be unhappy because core functions are not working like they wanted it to work, and things like that and then it can get rather difficult in the sense that you know and then you get, I'm talking about the user, they get unhappy, and then you have the technology department of the company that is also involved, and they become unhappy as well, because you know now you are running your code on their machines, and if they are not satisfied with your architecture, then it could take quite a while to resolve everything."

Analysis: She is looking back retrospectively at the process of development but also glances in the future when such a project will be taken on again. She acknowledges that it is not easy, the users and their demands can be challenging and the infrastructure is an issue to be taken very seriously. She speaks from experience and demonstrates the dynamics of systems and the many stakeholders to be kept satisfied. There are numerous perceptions on satisfaction during such an undertaking. As a result of so many issues and her knowledge of the challenges she does not even know if she wants to do it again in future. She is very realistic and honest about this.

EC2: "Or we could keep it as a phase two or something, because I can give you a letter that if they are going to start using it tomorrow, they would anyway want to change it - that is unfortunately how it works. I have seen it a lot of times…"

Analysis: This excerpt of EC2 illustrates a lesson that she has learnt for the future. Certain aspects of the system can be presented to the users in a second phase. Especially those functions that are not critical or essential. From experience she also states that users are often not satisfied with what they are issued with.